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DISCUSSION PAPERS

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How Well Do the Poor Connect to the Growth Process?

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How Well Do the Poor Connect to the Growth Process?

Executive Summary

by C. Peter Timmer

Income distribution is at the core of classical political economy, as the debates between Ricardo and Malthus attest. Marginal productivity as the key determinant of factor shares in national income is at the core of modern neoclassical economics, which focuses on efficient allocation of scarce resources. The basic model of economic development, Lewis' dual economy model with surplus labor, is driven by changes in income distribution over the growth process. Kuznets' empirical verification of the pattern suggested by the Lewis model established the "Kuznets Curve" as the paradigmatic relationship linking income distribution and economic development, with the distribution of income first worsening, then improving as per capita incomes rose over time.

The publication in 1996 of the Deininger-Squire data set on income distribution allowed preliminary testing of these fundamental theoretical models that had gone relatively untested for generations. At one level, the new data have supported a very comforting story. There is little doubt that rapid economic growth reduces poverty. Even cursory analysis of the Deininger-Squire data set on changes in income distribution over time reveals only a small handful of examples where economic growth on average failed to increase per capita incomes in the bottom twenty or forty percent of the income distribution. For some analysts, the investigation can stop at this point because economic growth seems to "trickle down" to the poor in most circumstances, at least in a limited way. Thus economic growth is nearly always better for the poor than retardation, and economists should get on with maximizing the rate of growth.

But most economists and nearly all policy makers are reluctant to stop at this point in the analysis because modern economic history--since World War II--has left growing numbers of poor people despite rapid economic growth by earlier historical standards. A statistical result that reports a strong linkage between economic growth and poverty alleviation under nearly all circumstances seems somehow to miss the growing numbers of poor, as well as the anecdotal stories about widening income gaps and the poor being left behind, stories with powerful political resonance. It would be useful to know if there is any statistical confirmation in the growth record to these stories and, if so, whether it is possible to improve the connection between growth and poverty alleviation revealed by this record.

The approach here is straightforward. A carefully chosen subset of the Deininger-Squire data is subjected to an innovative econometric procedure that utilizes the availability of five separate (but linked) observations--the per capita income of each quintile in the income distribution--for each year in which Deininger and Squire judge

the distributional data to be of good quality. Data for 27 developing countries, with a total of 181 observations--pass the Deininger-Squire quality test as well as the "relevance" test for the approach taken in this paper.

By merging data on shares of income (or, more commonly, expenditures) by quintile from the Deininger-Squire data base, with time series data on real per capita incomes in purchasing power parity equivalents from the Penn World Tables, it is possible to generate for each observation in the sample the per capita income in each quintile. Most researchers have used such data to calculate growth rates for the incomes of the bottom twenty or forty percent of the income distribution, with the time period of the calculation determined by data availability for each country in the sample. In what is now the standard approach to explaining the factors that cause economic growth, these growth rates are regressed on a variety of factors--structural, institutional, political, and economic--that help to explain their variation.

The approach here is different. Advantage is taken of the panel nature of the data to estimate a fixed-effects model of per capita income in each country for each year data on income distribution are available. The income data are meant to be comparable because they are in purchasing-power-parity dollars, so merging the data in this form is a promising avenue. With five observations for each country for each year of data on income distribution, multiple degrees of freedom are available to track the impact of variables on the functioning of each economy, including the impact of economic growth on income distribution itself, and vice versa.

The simplest approach determines the "elasticity of connection" between growth in the overall economy and growth in per capita incomes of each quintile. The results of estimating this elasticity for the present data set, where the dependent variable is specified as the logarithm of the per capita income of each quintile and the independent variable is the logarithm of average per capita income for the entire economy, are that not all five elasticities are equal to one. The elasticity for the poorest quintile is only 0.8 (and is significantly less than one), and the value rises steadily to slightly greater than one for the richest quintile. The distribution of income worsened during the process of economic growth.

As a hypothetical example, if economic growth of 5 percent per year per capita was maintained for twenty-five years, the elasticities estimated would produce a significant skewing of income distribution. As one indicator, the ratio of incomes in the top quintile to those in the bottom, 7.8 at the beginning of the growth exercise, would deteriorate to 10.3 by the end of the twenty-five years.

Why do these results seem to be at odds with the apparent rejection of the Kuznets curve reported in earlier research, which found a one-to-one relationship between economic growth and growth in the incomes of the poor? The short answer is that the fixed-effects model used in this paper captures the long-run connection of the poor to the

growth process, whereas the growth-rate model used in earlier research captures the extent to which the poor are connected to short-run shocks buffeting the overall economy.

In this sense, the "connection" coefficient in the growth rate model is actually capturing the extent to which the poor are able to buffer their incomes from macroeconomic shocks. The test is more telling when the quintile data are based on expenditures (nearly always) rather than incomes, because then the interpretation is a test of how well the poor are able to insure their consumption levels in the face of fluctuating incomes. A coefficient of one, the common result from these studies, suggests the poor are completely unable to stabilize their consumption path in the face of unstable incomes. This failure of the poor to self-insure against consumption risks is likely to have profound welfare consequences.

Neither model is "right" or "wrong." Each is asking a different question from the same data base. For understanding the issue in this paper, how well the poor connect to the long-run process of economic growth, the fixed-effects model offers more insights. It better captures the structure of the economies being examined than does the growth-rate model. Indeed, the approach used here has the potential to reveal how structural forces in an economy influence the distribution of income during the long-run process of economy growth, a potential ironically missing from the growth-rate models.

The two most important of these structural features are the share of agriculture in the economy and the relative size of the income gap between poor and rich. When weighted by their share in the labor force, the per capita labor productivities of workers in agriculture and non-agriculture seem to have differential effects on the average earnings in each income quintile. In countries in which the income gap is relatively small, labor productivity in agriculture is slightly but consistently more important in generating incomes in each of the five quintiles. Furthermore, agricultural productivity has a noticeable "anti-Kuznets" effect in these countries. A similar "anti-Kuznets" effect is seen from the non-agricultural sector and this impact is even more important to the poor because the non-agricultural sector makes up, on average, 75 percent of the overall economy. It also has the capacity to grow significantly faster than the agricultural economy over sustained periods of time.

For countries with large income gaps, the "early" (and discouraging) part of the Kuznets curve is a dramatic reality of their economies. In these countries, growth in agricultural productivity is no more successful in alleviating poverty than growth in the non-agricultural economy. Indeed, the rich benefit considerably from agricultural growth in countries with large income gaps, no doubt because of highly skewed distributions of land. But neither sector reaches the poor very effectively.

These contrasting structures have immediate implications for the distribution of economic growth. Maintaining the previous experiment of an economy growing by 5 percent per year in per capita terms, for twenty-five years, it is possible to show the impact. In economies with relatively small income gaps between rich and poor, this

growth process increases the per capita incomes of the bottom quintile by 241 percent after twenty-five years. Incomes in the top quintile increase by 211 percent; the "top quintile/bottom quintile" ratio actually falls from 5.10 to 4.65. The contrast with the growth process in economies with wide income gaps is stark. Incomes of the bottom quintile increase by just 73 percent over the twenty-five years, whereas incomes in the top quintile increase by 273 percent! The "top/bottom" ratio deteriorates from 13.1 at the start to 28.4 at the end. If these countries could sustain such rapid economic growth for twenty-five years, they would end up with a distribution of income about as bad as that in Brazil.

These results suggest that the relatively good income distributions in some countries of East, Southeast, and South Asia produce a growth process that is more sustainable than in countries with highly skewed income distributions. The reasons are almost certainly political and may hinge importantly on the extent of political liberties and flexibility in the labor market. Economies with few political choices, low and stagnant labor productivity in agriculture, and structural rigidities in moving that labor to more productive sectors are likely to find a visibly growing income gap between the rich and the poor to be more destabilizing than in economies that are open and flexible.

Evidence from the record of economic growth from 1965 to 1985 and from 1985 to 1995 provides a rough confirmation of this line of speculation. When the difference in the rate of growth of per capita incomes between these two periods is regressed on the average relative size of the income gap for each country, the result is a large, negative coefficient that is significant at the one percent level. Controlling for the (logarithm of the) level of per capita income at the end of the period and the growth rate in the first period, a larger income gap is significantly associated with a sharp slowdown in the rate of economic growth from the first to the second period. Richer countries experience a smaller slowdown than poorer countries, suggesting that it is possible to "buy" political stability. And controlling for the other two factors, a faster rate of economic growth in the first period is also associated with a slower rate in the second, suggesting that there is considerable "luck of the draw," or regression to the mean, in individual growth rates.

The apparent failure of economic growth to reach the poor in precisely those environments where the connection would seem to be most crucial is clearly disappointing, but should not be taken as a council of despair or a general indictment of economic growth itself. Even in societies that start with a wide income gap, growth has a positive, although small, impact on the poor, and failure to grow will certainly hurt the poor. More positively, visible and pro-active measures to reach the poor as a concomitant part of trade opening, structural adjustment, and privatization programs designed to speed economic growth will help to sustain the growth-friendly initiatives. Perhaps the failure to sustain rapid economic growth in countries with wide (and widening) income gaps is no mystery when viewed in the context of these results.

How Well Do the Poor Connect to the Growth Process?

by C. Peter Timmer

Income distribution is at the core of classical political economy, as the debates between Ricardo and Malthus attest. Marginal productivity as the key determinant of factor shares in national income is at the core of modern neoclassical economics, which focuses on efficient allocation of scarce resources. The basic model of economic development, Lewis' dual economy model with surplus labor, is driven by changes in income distribution over the growth process (Lewis, 1954). Kuznets' empirical verification of the pattern suggested by the Lewis model established the "Kuznets Curve" as the paradigmatic relationship linking income distribution and economic development, with the distribution of income first worsening, then improving as per capita incomes rose over time (Kuznets, 1955).

If theory is any guide, it would seem that economists should understand exactly what determines the distribution of income and how that distribution affects the process of economic growth. As part of that understanding, and especially because the welfare consequences are so important, it would seem that a clear picture of how the poor participate in the growth process would be readily available. Most crucially, this picture ought to help policy makers condition the growth process in ways that differentially empower the poor.

Of course, this picture is fuzzy at best. Lack of accurate data on income distribution, comparable across the lengthy time periods needed to understand the growth process, has been a particular constraint on filling in the details not discernible from the theorist's broad brush. This constraint has been felt even in rich countries (Kuznets provided no statistical tests for his conjectured curve), and such data have been virtually non-existent for poor countries. India has been an exception, and the work of Martin Ravallion and Gaurav Datt on National Sample Survey data since the 1950s has shown the

possibilities for understanding in great detail how the poor connect, or fail to connect, to economic growth by sector or across regions (e.g., Ravallion and Datt, 1996; Datt and Ravallion, 1997). But until recently the analysis has been limited to India, not a country with a record of rapid economic growth and structural transformation.

The publication in 1996 of the Deininger-Squire data set on income distribution softened this data constraint considerably and scholars have rushed to fill the empirical void created by the availability of fundamental theoretical models that had gone relatively untested for generations (Deininger and Squire, 1996; Fields, 1997; Gallup, Radelet, and Warner, 1997; Ravallion and Chen, 1997; Roemer and Gugerty, 1997).

At one level, the new data have supported a very comforting story. There is little doubt that rapid economic growth reduces poverty. Even cursory analysis of the Deininger-Squire data set on changes in income distribution over time reveals only a small handful of examples where economic growth on average failed to increase per capita incomes in the bottom twenty or forty percent of the income distribution. For some analysts, the investigation can stop at this point because economic growth seems to "trickle down" to the poor in most circumstances, at least in a limited way. Thus economic growth is nearly always better for the poor than retardation and economists should get on with maximizing the rate of growth.

But most economists and nearly all policy makers are reluctant to stop at this point in the analysis because modern economic history--since World War II--has left growing numbers of poor people despite rapid economic growth by earlier historical standards. A statistical result that reports a strong linkage between economic growth and poverty alleviation under nearly all circumstances seems somehow to miss the growing numbers of poor, as well as the anecdotal stories about widening income gaps and the poor being left behind, stories with powerful political resonance. It would be useful to know if there is any statistical confirmation in the growth record to these stories and, if so, whether it is possible to improve the connection between growth and poverty alleviation revealed by this record.

A somewhat more sophisticated analysis of the Deininger-Squire data set begins to address this concern by considering the statistical relationship between growth in per capita incomes of the poor and growth in the overall economy. On average, each one percent increase in per capita incomes for the overall population is matched by a one percent increase in the per capita incomes of those in the bottom forty percent of the income distribution. Thus, on average, there has been a one-to-one link, in percentage terms, between overall income growth and growth in the incomes of the poor. The "representative" growth experience of developing countries since the 1960s seems to have been neutral with respect to income distribution. The Kuznets curve observed during the development of the currently rich countries of the world appears not to be inevitable for those countries trying to catch up (Roemer and Gugerty, 1997).

Even more sophisticated analysis of an expanded data set based on the Deininger-Squire data shows yet further nuances in the connection between economic growth and the incomes of the poor. A one percent growth in agricultural GDP per capita leads to a 1.61 percent increase in per capita incomes of the bottom quintile of the population in 35 developing countries. A similar one percent increase in industrial GDP increases the incomes of the poor by 1.16 percent. And the incomes of the bottom quintile increase by only 0.79 percent with a one percent increase in service sector GDP (Gallup, Radelet, and Warner, 1997). Although these differences are not statistically significant because of noise in the data, they do suggest that, on average, the sectoral composition of growth affects the strength of the linkage between economic growth and poverty.

What other factors affect this linkage, and what mechanisms explain their impact? This paper argues that these questions can be addressed from four perspectives: (1) the level of absolute poverty; (2) relative income distribution; (3) the income gap between upper and lower strata of the income distribution; and (4) asset distribution. For each of these alternative ways of defining poverty, two separate pathways of influence can be explored. First, each of these four characterizations of poverty is likely to have an impact on the rate of economic growth itself (Birdsall, et. al., 1995; Larraín and Vergara,

1997). Because, at a minimum, faster economic growth on average leads to faster reduction in the level of absolute poverty, identifying and quantifying these mechanisms will be important, especially in efforts to build a more general theory that connects the new empirical relationships to models of income distribution and economic growth.

Second, sectoral growth rates clearly have a differential impact on the poor. Ravallion and Datt can find no impact on the poor from growth in the Indian manufacturing sector, even in urban areas, whereas rural growth reduces poverty in both rural and urban areas (Ravallion and Datt, 1995). As noted, preliminary analysis of the expanded Deininger-Squire data set by Gallup, Radelet, and Warner (1997) also hints at the potential for strengthening the linkage from economic growth to poverty alleviation through sectoral priorities. Further, historical experience argues that development strategies and economic policies can significantly strengthen the contribution of the overall growth process to poverty alleviation (Dasgupta, 1993; Fogel, 1994). In some countries, growth strategies have permitted an improvement in the distribution of income at the same time that rapid growth was sustained (World Bank, 1993). In these countries, declines in the levels of absolute poverty have been the fastest in history (Timmer, 1996a).

But even in these countries the income gap between rich and poor has widened. And although the data are spotty, there are plausible reasons to think that asset distributions have also become significantly less equal. As countries approach middle income levels, widening income gaps and concentration of assets in the hands of the visible few have the potential to become politically destabilizing even as absolute poverty is nearly eliminated (or perhaps because of this success). It seems likely that there is a major transition in the political economy of poverty as most absolute poverty is alleviated, and thus the portfolio of approaches to coping with the four different characterizations of poverty will likely have to change as well (A. Timmer, 1997).

Figure 1 presents a rough schematic framework for the discussion in this paper. On the left side of the figure are a set of basic factors that are known to influence the overall rate of economic growth (Barro and Sala-i-Martin, 1995). Some of these influences

are better quantified than others, and the results reported here complement those of Gallup, Radelet and Warner, which establish several of these quantitative linkages much more carefully and accurately.

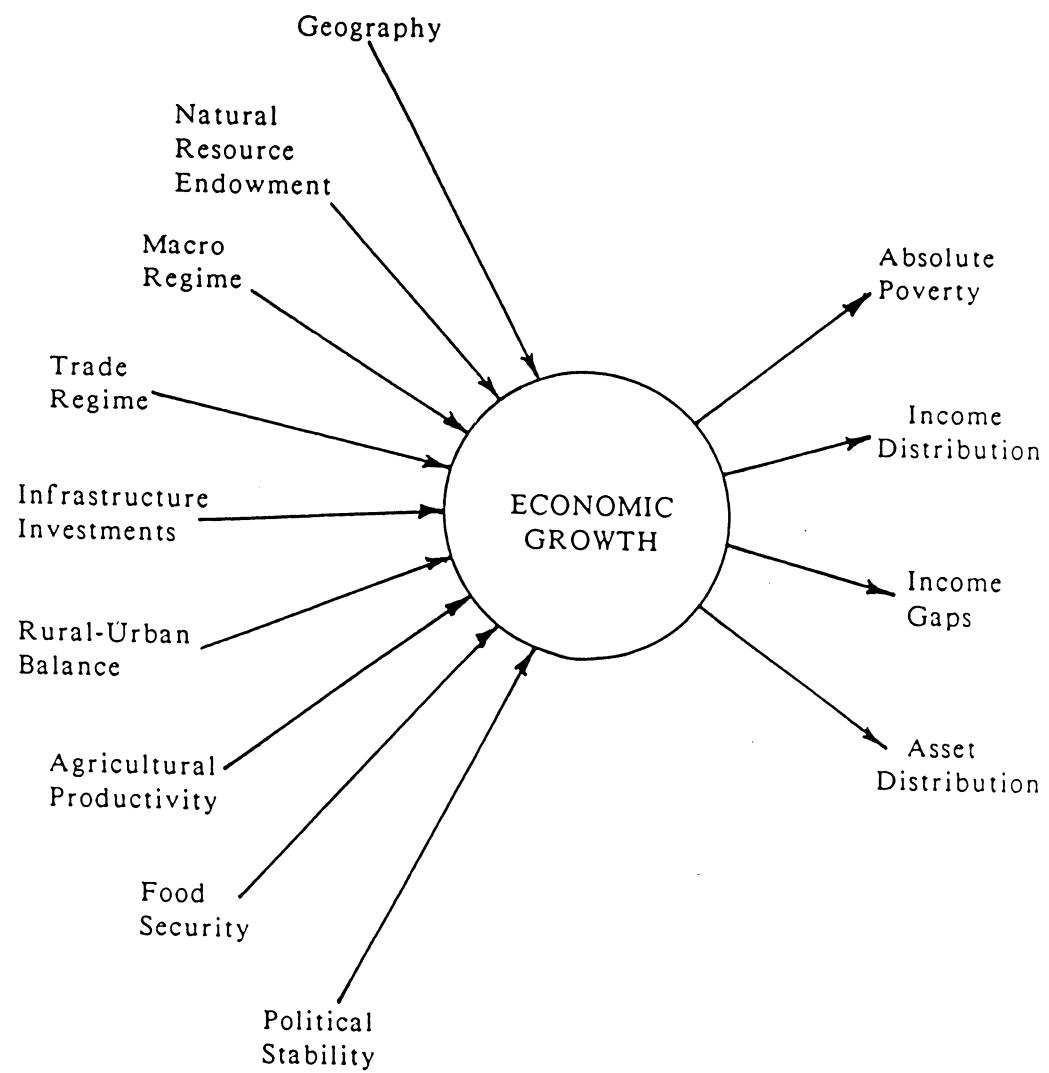
Many of these influences on growth are themselves complementary and interactive, possibly with threshold effects which have been difficult to discern in the empirical record so far. Some of these variables are structural (e.g. "geography" or natural resource endowment), some are strategic (e.g. the rural-urban balance or the macro regime), and some result from clear policy or investment choices (e.g. infrastructure, trade regime, agricultural productivity, or food security). What they have in common on the left side of Figure 1 is the ability to influence the rate of economic growth.

On the right side of Figure 1 are the outcome measures of particular interest in this paper, the effects of economic growth on the level of absolute poverty, on income distribution, on the size of the income gap between, for example, the top and bottom quintile of the income distribution, and on the distribution of assets. All four of these variables are also likely, as was argued above, to influence the rate of economic growth, although the sign of the influence is still controversial and the mechanisms that cause the influence are the subject of ongoing research (Alesina and Perotti, 1993; Perotti, 1996; Larraín and Vergara, 1997).

The primary interest here is in the other direction: to understand the quantitative linkages between economic growth and each of the poverty variables--that is, their statistical relationship--and to understand the analytical mechanisms that influence the effectiveness of these linkages--that is, the behavioral foundations and causal relationships that actually generate the linkages seen in the empirical record. Again, a general theory would need to explain the mechanisms in both directions.

The approach here is straightforward. A carefully chosen sub-set of the Deininger-Squire data is subjected to an innovative econometric procedure that utilizes the availability of five separate (but linked) observations--the per capita income of each

Figure 1.--Establishing Linkages Between Economic Growth and Poverty Alleviation



quintile in the income distribution--for each year in which Deininger and Squire judge the distributional data to be of good quality. Data for 27 developing countries, with a total of 181 observations--pass the Deininger-Squire quality test as well as the "relevance" test for the approach taken in this paper. Relevance required reasonable size--only Jamaica (2.5 million) and Costa Rica (3.4 million), each included for geographical representation, have populations smaller than the 5.9 million in Honduras, the next smallest country in terms of population. The population represented in the sample totaled more than 3.3 billion in 1995, or two-thirds of the total population of the low and middle income countries, as classified by the World Bank (1997).

In view of the motivating hypothesis that the rural economy is likely to have especially important linkages to incomes of the poor, all countries included in the sample have significant agricultural sectors. The least important is the 5 percent of GDP contributed by the agricultural sector of Venezuela in 1990, but the average for the countries is 25 percent. Perhaps more telling, the average share of agricultural workers in the overall labor force is 51 percent in this sample, reflecting the importance of the sector in employment and income generation for the poor.

The sample is also reasonably representative of the developing world. If population share is the criterion, the 10 countries from Latin America with 57 observations over-represent that region, and Africa, East Asia, and South Asia are somewhat under-represented. If regional GDP is the criterion, South Asia is over-represented and Latin America is under-represented. Only Africa is significantly under-represented in the sample if a simple average of these two criteria is used (see Table 1). The data themselves are shown in Appendix A.

In summary, the data set consists of 181 observations from 27 countries over a time period that extends from 1960 to 1992. The most observations for individual countries are for India, Brazil, China, Taiwan, and Korea, with 22, 15, 12, 12, and 11 observations respectively. For Chile, Dominican Republic, Guatemala, Honduras, Morocco, Tunisia, and Uganda, just two observations each are available, the minimum needed for the

Table 1. -- Basic Data

Country and Regional Group	Country Codes	# of Obs	1995 Pop (millions)	1995 GDP per capita		1995 GDP (billion PPP\$)	Avggerage Relative Income Gap*	Avg. GNP growth p.c.	
				USD	PPP\$			1965-1985	1985-1995
<u>Latin America</u>									
Brazil	BRA - 28	15	159.2	3,640	5,400	860	2.99	4.3	-0.8
Chile	CHL - 37	2	14.2	4,160	9,520	135	2.57	-0.2	6.1
Columbia	COL - 42	7	36.8	1,910	6,130	226	2.63	2.9	2.6
Costa Rica	CRI - 45	7	3.4	2,610	5,850	20	2.52	1.4	2.8
Dom. Republic	DOM - 56	2	7.8	1,460	3,870	30	2.35	2.9	2.1
Guatemala	GTM - 81	2	10.6	1,340	3,340	35	2.81	1.7	0.3
Honduras	HND - 86	2	5.9	600	1,900	11	2.90	0.4	0.1
Jamaica	JAM - 99	5	2.5	1,510	3,540	9	2.14	-0.7	3.6
Mexico	MEX - 127	6	91.8	3,320	6,400	588	2.81	2.7	0.1
Venezuela	VEN - 202	9	21.7	3,020	7,900	171	2.22	0.5	0.5
<u>East & SE Asia</u>									
China	CHN - 38	12	1,200.2	620	2,920	3,505	1.53	4.8	8.3
Indonesia	IDN - 90	7	193.3	680	3,800	735	1.72	4.8	6.0
S. Korea	KOR - 108	11	44.9	9,700	11,450	514	1.76	6.6	7.7
Malaysia	MYS - 140	5	20.1	3,890	9,020	181	2.56	4.4	5.7
Philippines	PHL - 156	5	68.6	1,050	2,260	155	2.49	2.3	1.5
Taiwan	OAN - 151	12	21.0	11,236	13,240	291	1.49	-	-
Thailand	THA - 188	8	58.2	2,740	7,540	439	2.39	4.0	8.4
<u>South Asia</u>									
Bangladesh	BGD - 19	9	119.8	240	1,380	165	1.75	0.4	2.1
India	IND - 92	22	929.4	340	1,400	1,301	1.64	1.7	3.2
Sri Lanka	LKA - 116	8	18.1	700	3,250	59	2.04	2.9	2.6
Pakistan	PAK - 153	9	129.9	460	2,230	290	1.59	2.6	1.2
<u>Africa</u>									
Ivory Coast	CIV - 39	4	14	660	1,580	22	1.98	0.9	-4.6†
Ghana	GHA - 72	3	17.1	390	1,990	34	1.80	-2.2	1.4
Morocco	MAR - 122	2	26.6	1,110	3,340	89	1.98	2.2	0.9
Tunisia	TUN - 193	2	9	1,820	5,000	45	2.09	4.0	1.9
Uganda	UGA - 196	2	19.2	240	1,470	28	1.87	-2.6	2.7
<u>Other</u>									
Turkey	TUR - 194	3	61.1	2,780	5,580	341	2.58	2.6	2.2

*(Per capita income in Quintile V minus per capita income in Quintile I) divided by average per capita income, all in \$PPP.

†1985-1994.

statistical procedure used here. A number of important variables from this data set are illustrated graphically in time series form, country by country, in Appendix B.

The Statistical Approach

By merging data on shares of income (or, more commonly, expenditures) by quintile from the Deininger-Squire data base with time series data on real per capita incomes in purchasing power parity equivalents from the Penn World Tables (Summers and Heston, 1991, with 1996 update), it is possible to generate for each observation in the sample the per capita income in each quintile. Most researchers have used such data to calculate growth rates for the incomes of the bottom twenty or forty percent of the income distribution, with the time period of the calculation determined by data availability for each country in the sample (Deininger and Squire, 1996; Ravallion and Chen, 1997; Roemer and Gugerty, 1997; Gallup, Radelet, and Warner, 1997). In what is now the standard approach to explaining the factors that cause economic growth, these growth rates are regressed on a variety of factors--structural, institutional, political, and economic--that help to explain their variation (Barro and Sala-i-Martin, 1995).

The approach here is different. Advantage is taken of the panel nature of the data to estimate a fixed-effects model of per capita income in each country for each year data on income distribution are available. The income data are meant to be comparable because they are in purchasing-power-parity dollars, so merging the data in this form is a promising avenue. With five observations for each country for each year of data on income distribution, multiple degrees of freedom are available to track the impact of variables on the functioning of each economy, including the impact of economic growth on income distribution itself, and vice versa.

The simplest approach replicates the spirit of the analysis conducted by Roemer and Gugerty (1997), which determined the "elasticity of connection" between growth in the overall economy and growth in per capita incomes of the poor, specified as either the

bottom twenty or forty percent of the income distribution. Table 2 presents the results of estimating this elasticity for the present data set, where the dependent variable is specified as the logarithm of the per capita income of each quintile and the independent variable is the logarithm of average per capita income for the entire economy (Log Avg Y). The estimating equation also includes "fixed effects," separate dummy variables for each country in the sample (excluding Ghana, whose impact is included in the intercept term), as well as separate dummy variables for data from the 1960s, the 1970s, and the 1980s (thus accounting for high R² for each quintile regression). The impact of data from the 1990s is also included in the intercept term. Table 2 reports how many of these fixed effects coefficients are significant in each regression. Details of each regression, one for each income quintile, are shown in Appendix C.

It is obvious from basic national income accounting identities that the sum of the elasticities for the five quintiles should equal one when each elasticity is weighted by the share in national income of the respective quintile. Table 2 also presents in Panel B the results of estimating a complete system of all five equations that imposes this "adding up" constraint. It is a reassuring test of the quality of the data that the weighted sum of the unconstrained elasticities reported in Table 2 totals 0.989, not significantly different from 1.0. Imposing the adding-up constraint changes the individual elasticities very little. Panel C reports that only in quintile IV does the coefficient change by as much as two percent.

Interestingly, not all five elasticities are equal to one. As Figure 2 shows, the elasticity for the poorest quintile is only 0.8 (and is significantly less than one), with the value rising steadily to slightly greater than one for the richest quintile. Despite its unfamiliar shape, Figure 2 can be interpreted as part of a Kuznets curve, the "early" part when income distribution deteriorates with rising incomes. The curve in Figure 2 was generated by the structure of economic growth in a representative sample of developing countries, and shows clearly that the distribution of income worsened as a result of this growth process.

Table 2. -- Estimates of the “Elasticity of Connection” between average per capita income (in \$PPP) and per capita income by quintile.

Panel A: Sum of Weighted Elasticities Not Constrained to Equal One.

	Quintile I (poorest)	Quintile II	Quintile III	Quintile IV	Quintile V (richest)
Constant (t)	0.408 (0.8)	-0.206 (0.3)	-0.080 (0.3)	0.097 (0.2)	0.622 (3.2)
Log Avg Y (t)	0.790 (11.4)	0.948 (21.2)	0.975 (27.4)	0.992 (11.5)	1.022 (36.6)
Countries*	12	14	12	1	15
Decades*	2	0	0	0	0
\hat{R}^2	0.909	0.966	0.981	0.907	0.993

Panel B: Sum of Weighted Elasticities Constrained to Equal One.

Constant (t)	0.343 (0.973)	-0.292 (0.8)	-0.179 (0.5)	-0.011 (0.0)	0.588 (3.0)
Log Avg Y (t)	0.800 (15.8)	0.961 (19.3)	0.990 (20.3)	1.012 (21.8)	1.029 (38.5)
Countries*	16	12	9	4	12
Decades*	2	0	0	0	0
\hat{R}^2	0.908	0.966	0.981	0.907	0.993

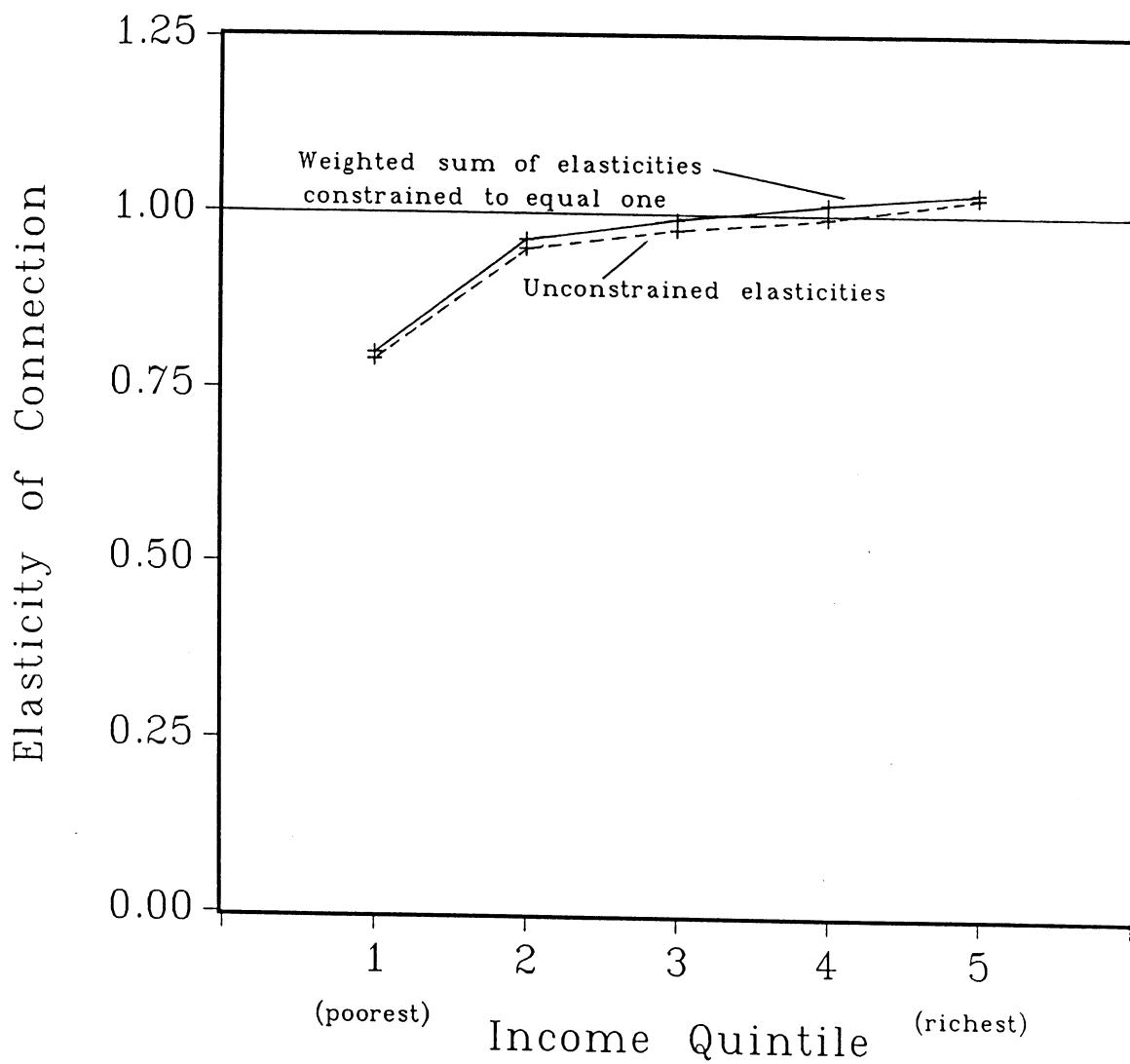
Panel C: Percent Change in “Elasticity of Connection” Due to Constraining the Weighted Sum of the Elasticities to Equal One.

Percent Change	1.27%	1.37%	1.54%	2.02%	0.68%
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*Numbers for “Countries” and “Decades” indicate the number of variables in each category significant at 10 percent or higher.

SOURCE: Author’s estimates from data in Deininger and Squire (1996).

Figure 2.--"Elasticity of Connection" between average per capita income (in \$PPP) and per capita income by quintile



SOURCE: Data in Table 2.

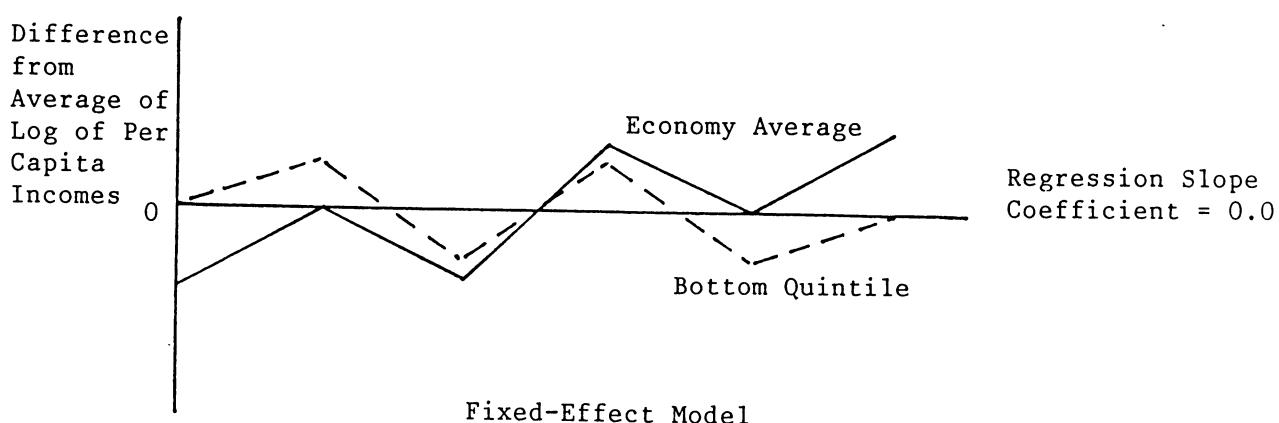
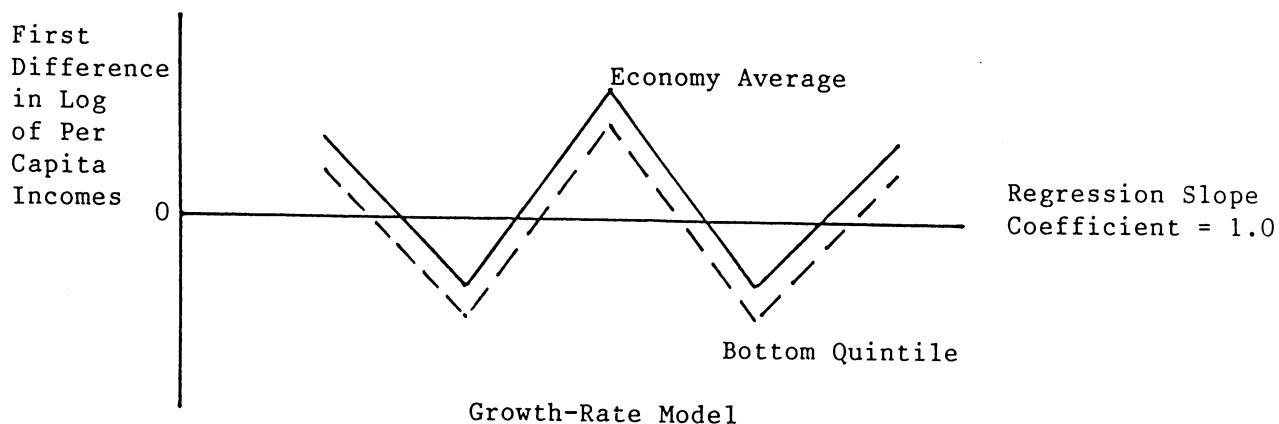
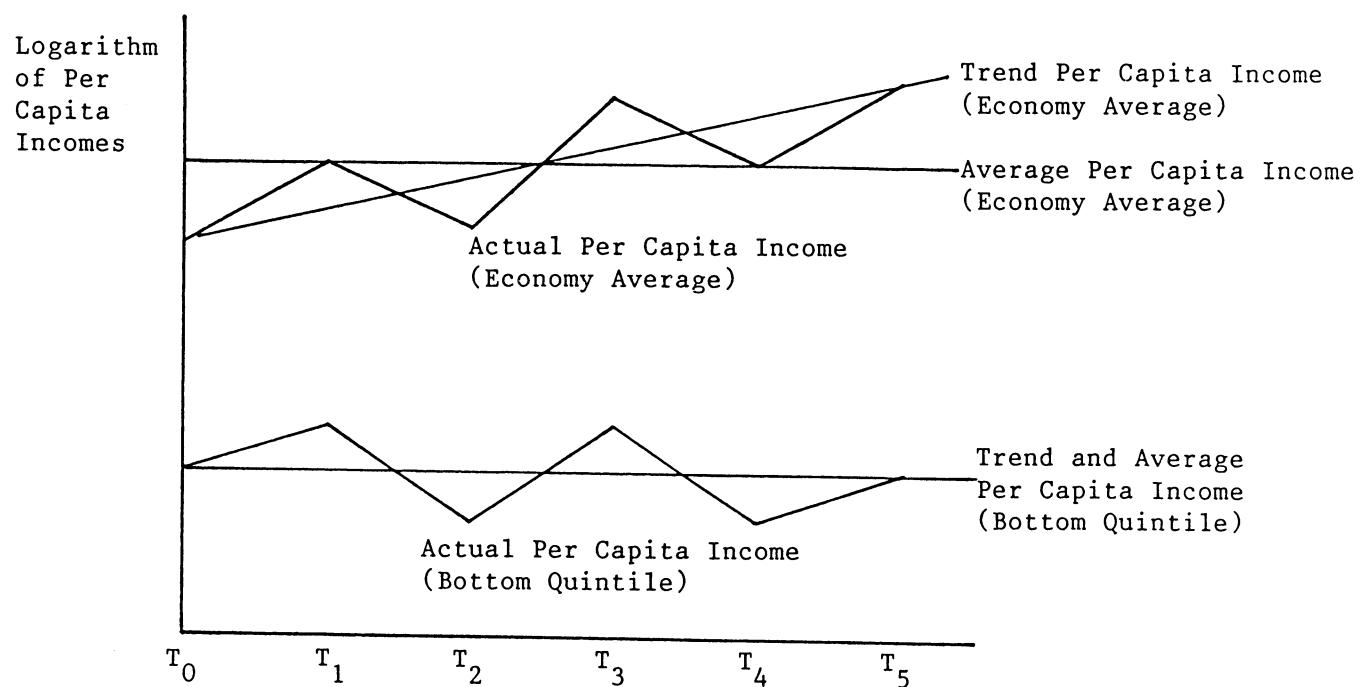
Indeed, as a hypothetical example to be used throughout the rest of the discussion, if economic growth of five percent per year was maintained for 25 years, the elasticities shown in Figure 2 would produce a significant skewing of income distribution. As one indicator, the ratio of incomes in the top quintile to those in the bottom, 7.8 at the beginning of the growth exercise, would deteriorate to 10.3 by the end of the 25 years.

Why do these results seem to be at odds with earlier findings that there is nearly a one-to-one relationship between economic growth and incomes of the poor, an apparent rejection of the Kuznets curve? The answer lies in the underlying growth model that motivates the different statistical approach used to obtain the results reported here, and how this model contrasts with the growth model underlying statistical analysis using growth rates.

Consider the stylized economy shown in Figure 3. The top panel shows the logarithm of per capita incomes over time for both the national average and the bottom quintile. Average per capita incomes grow steadily along a trend, with a "white noise" error term each year caused by exogenous shocks from weather, variable inflation, surprises in the external terms of trade, and so on. By contrast, and to make the story clear and dramatic, the per capita incomes of the bottom quintile are assumed not to grow at all on trend. However, the incomes of the bottom quintile, or, more accurately, their expenditures, suffer exactly the same relative shocks as the overall economy suffers. In this hypothetical economy, then, the poor are entirely disconnected from the long-run growth process, but do feel the short-run shocks to the macro economy. Although the contrasts are starkly drawn for the purposes of illustrating the analytical point, it is not too difficult to think of worlds that would resemble this setting.

The second panel in Figure 3 shows how the data on economic growth would look to a statistician seeking to explain any connection between overall income growth and growth in the incomes of the poor. This panel plots the change in the logarithm of per capita income, which is equal to the growth rate (shown in the top panel), for each time period, for both the average and the bottom quintile. A regression of the rate of growth

Figure 3.--Implications of Using Growth-Rate Models versus Fixed-Effect Models to Estimate the Connection Between Growth in Average Incomes Per Capita and Income of the Poor



in per capita income of the bottom quintile on the rate of growth in average per capita income would show an "elasticity of connection" of exactly one, with a negative intercept equal to the difference in the trend rates of growth. That is, a model based on growth rates is implicitly a model of first differences, and such a model automatically removes differences in trends of the two variables and places that difference in the intercept term.

The third panel in Figure 3 shows how the data would appear to a statistician using the fixed-effects model based on income levels rather than growth rates. That is, each year's observation is the difference between the actual per capita income, on average or for the lowest quintile, and the overall average for that country, for all the observations available. A regression run on the data points in the bottom panel produces an "elasticity of connection" of exactly zero, which is in fact the degree to which the bottom quintile is connected to the long-run growth process. Thus the fixed-effects model is capturing the long-run connection of the poor to the growth process, whereas the growth rate model captures the extent to which the poor are connected to short-run shocks buffeting the overall economy.

In this sense, and following a similar argument in Datt and Ravallion (1997), the "connection" coefficient in the growth rate model is actually capturing the extent to which the poor are able to buffer their incomes from macroeconomic shocks. The test is actually more telling when the quintile data are based on expenditures (nearly always) rather than incomes, because then the interpretation is a test of how well the poor are able to insure their consumption levels in the face of fluctuating incomes. A coefficient of one, the common result from these studies, suggests the poor are completely unable to stabilize their consumption path in the face of unstable incomes. This failure of the poor to self-insure against consumption risks is likely to have profound welfare consequences (Morduch, 1994).

Neither model is "right" or "wrong." They are asking different questions from the same data base. For understanding the issue in this paper, how well the poor connect to the long-run process of economic growth, the fixed-effects model offers more insights. It

better captures the structure of the economies being examined than does the growth-rate model. Indeed, the approach used here has the potential to reveal how structural forces in an economy influence the distribution of income during the long-run process of economy growth, a potential ironically missing from the growth-rate models.

Two steps are possible for testing this potential and they are tried sequentially in the following sections. A final section speculates about the political economy implications of the findings and points toward further research needed to clarify these issues.

The Impact of Income Distribution on the Distribution of Growth

At one level, it would seem to be a tautology that the distribution of income will affect the distribution of growth in incomes. Upon reflection, of course, the connection is not so obvious. For example, Gallup, Radelet and Warner (1997) find that the initial level of per capita income in the lowest quintile is negatively associated with growth in income for that quintile. Although some of this effect may be simple regression to the mean caused by measurement error in the quintile shares, part of it may be due to a genuine convergence effect that tends to reduce skewing in the distribution of income, both within and across countries. The convergence effect--based on the logic of the neoclassical Solow growth model--provides an alternative, and contradictory, mechanism to the more popular view that "it takes money to make money." In this view, traceable to the Bible and Adam Smith, a skewed income distribution is likely to be self-reinforcing over time, as only the rich can accumulate assets that provide faster income growth than comes from wage labor.

Which mechanism is dominant is an empirical issue. The test here relies on the "self-reinforcing" logic of the asset distribution mechanism sketched above. A variable is constructed that measures the relative income gap between the rich and the poor, and this variable is then used to define a dummy variable that is equal to one when the observation reflects a highly unequal distribution of income. Specifically, the per capita

income of the bottom quintile is subtracted from that of the top quintile, and this "income gap" is then compared with average per capita income for that particular observation. When the resulting value exceeds two--the gap is twice as large as average income--the dummy variable (W2) is equal to one; it is zero otherwise.

Simply adding this dummy variable to the regressions that produced Figure 2 produces few surprises. The "elasticities of connection" are little changed, but in general are estimated more precisely. When W2 is equal to one--the income gap is relatively large--incomes of the poor are shifted down significantly. In the bottom quintile the shift is 27 percent; it is 21 percent and 10 percent respectively in the next two quintiles. The shift in the fourth quintile is not significant, whereas the highest quintile experiences a 15 percent increase in its per capita income. There is not much more than accounting to these results, although it is interesting to see the magnitudes of the changes by quintile.

A more revealing exercise is to permit the elasticities to shift as well as the intercept term in those economies with relatively large income gaps. By and large, the results are not very significant in statistical terms, although the coefficient of most interest, the shift in the bottom quintile, is significant at the ten percent level. The negative direction of the shift suggests that the poor in "unequal" economies are not just poor, they are not nearly as well connected to the growth process in the rest of the economy as their poor cousins in economies with smaller relative income gaps, a result consistent with those reported by Birdsall, et al. (1995) and Ravallion (1996).

These results are suggestive, but they merely hint at the underlying structure that might actually cause economies with different relative income gaps to generate systematically different connections to each income quintile. The obvious starting point in a search for this structure is to divide the economy into its agricultural and non-agricultural components to see if these systematic differences can be traced to basic sectoral patterns of income growth (Anand and Kanbur, 1993; Timmer, 1995). The next section adds a disaggregation along these sectoral dimensions to the disaggregation by relative income gap just reported. The results are quite startling.

The "Elasticity of Connection" from Agriculture and Non-Agriculture

National income data are generally reported by sectoral origin of gross domestic product (GDP). These data can be used to calculate the share of GDP originating each year in agriculture and non-agriculture. For the countries and years in the data set used here, 25 percent of GDP originated from the agricultural sector on average, with 75 percent from non-agriculture.

From the data set on agricultural labor force recently constructed by Larson and Mundlak (1997), it is also possible to estimate the share of the total labor force working in agriculture for each country and year. Again, for this sample, the average was 51 percent. These data, when combined with data on share of GDP from agriculture and the PPP estimates of average real per capita income used earlier, can be used to construct estimates of agricultural GDP per agricultural worker, which serve as a proxy for per capita productivity of workers in this sector. Simple accounting identities permit construction of a similar series for non-agricultural workers. On average, agricultural GDP per capita is PPP\$1,021 per year compared with average GDP per capita of PPP\$2,393. Since 51 percent of the labor force is in agriculture on average, non-agricultural GDP per capita works out to PPP\$3,636. On average, agricultural workers produce less than a third of what workers outside of agriculture produce. This relatively low productivity is a structural characteristic of nearly all poor countries, and raising it is a key source of growth during the structural transformation (Kuznets, 1955; Timmer, 1988).

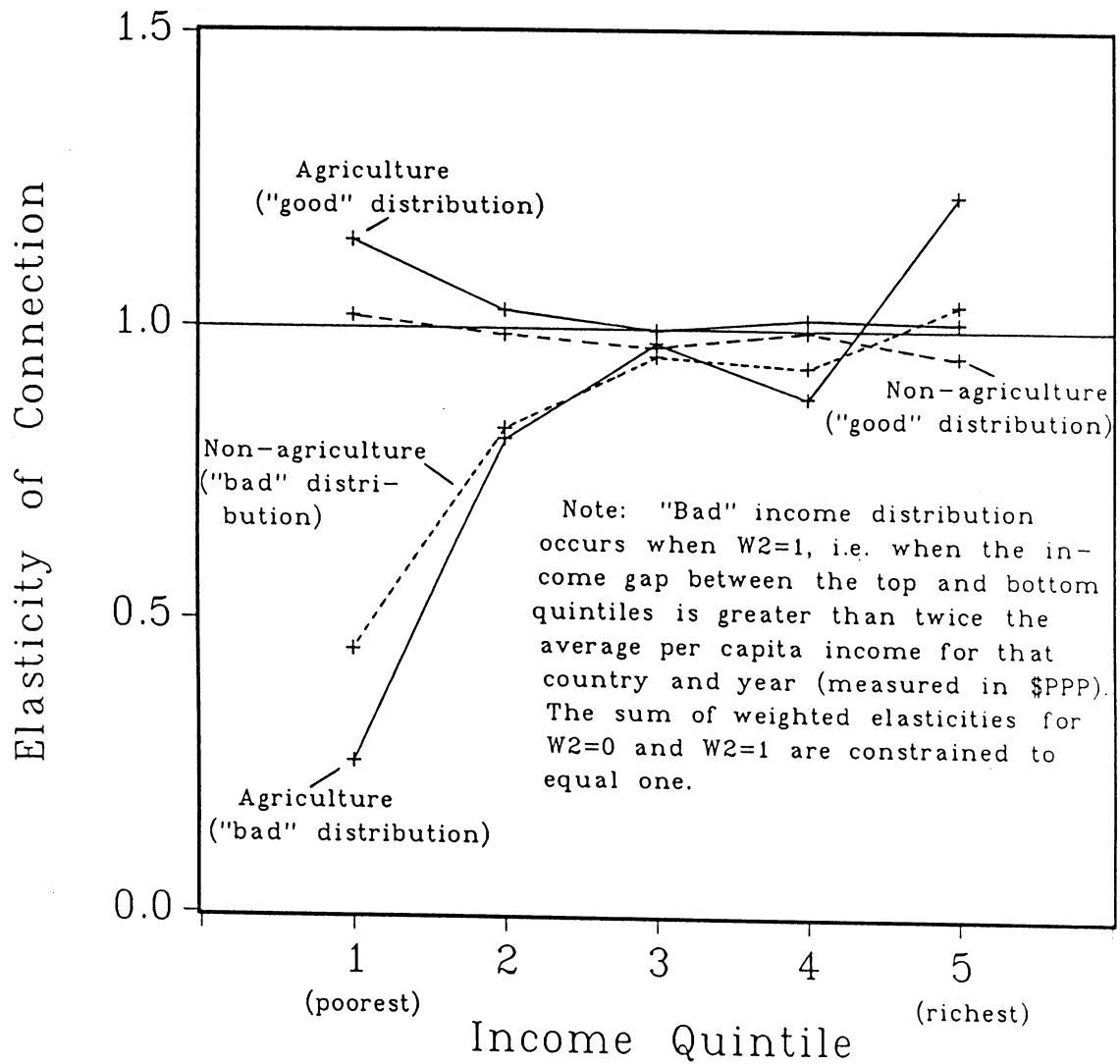
The question to be examined is whether the sectoral composition of labor productivity matters in a significant way to incomes earned by each quintile. Preliminary results from asking a similar question have already indicated that growth in the agricultural sector seems to have a much larger impact on growth of incomes in the bottom quintile than growth in services or industry (Ravallion and Datt, 1996; Gallup, Radelet, and Warner, 1997). The question here is framed in terms of relative labor

productivities. When weighted by their share in the labor force, do the per capita labor productivities of workers in agriculture and non-agriculture have differential effects on the average earnings in each income quintile (Timmer, 1996b)?

Figure 4 shows the startling results promised above. The disaggregation into "good" and "bad" levels of the relative income gap is maintained in the regressions that provide these results. That is, elasticity "shifters" are included for both the agricultural and non-agricultural coefficients, and they are highly important for understanding the underlying structure and dynamics of the countries in this sample (see Table 3. Full statistical results are presented in Appendix D). Two fundamentally different growth processes seem to be at work with respect to the roles of labor productivity in agriculture and non-agriculture, and how these affect incomes in each of the five quintiles of the income distribution.

In countries where the income gap is relatively small, labor productivity in agriculture is slightly but consistently more important in generating incomes in each of the five quintiles. Furthermore, agricultural productivity has a noticeable "anti-Kuznets" effect in these countries. Using the results in Panel B of Table 3, where weighted elasticities are constrained to add up to one for each of the sub-samples, the elasticities of connection for the bottom two quintiles average 1.087, about 8 percent greater than the average for the top three quintiles of 1.005. A similar "anti-Kuznets" effect is seen from the non-agricultural sector and this impact is even more important to the poor because the non-agricultural sector makes up, on average, 75 percent of the overall economy. It also has the capacity to grow significantly faster than the agricultural economy over sustained periods of time. A simple regression explaining the elasticities of connection as a function of a dummy variable when sectoral growth is from agriculture as well as the quintile and quintile squared shows that agricultural growth raises the average contribution to growth for the five quintiles by 5.5 percentage points. The elasticities decline in the quadratic specification until the fifth quintile, confirming the "anti-Kuznets" effect for the sample of developing countries with relatively good distributions of income (see Appendix E).

Figure 4.--"Elasticity of Connection" between labor productivity in agriculture and non-agriculture and income per capita by quintile, for "good" and "bad" income distributions



SOURCE: Data in Table 3

Table 3. -- Estimates of the “Elasticity of Connection” between per capita income by quintile and average per capita income (in \$PPP) for agriculture and non-agriculture separately, for countries with “good” and “bad” distribution of income.¹

Panel A: Sum of Weighted Elasticities Not Constrained to Equal One

	Quintile I (poorest)	Quintile II	Quintile III	Quintile IV	Quintile V (richest)
Constant	-1.695	-0.712	-0.235	-0.120	0.578
(t)	(1.6)	(1.0)	(0.4)	(0.1)	(1.0)
Log Ag Y	1.160	1.049	1.021	1.050	1.073
(t)	(6.2)	(8.0)	(9.2)	(4.1)	(10.6)
Log Non-Ag Y	1.026	0.999	0.981	1.012	0.988
(t)	(9.2)	(12.9)	(14.9)	(6.6)	(16.5)
W2	5.096	1.306	0.169	0.801	-0.724
(t)	(3.5)	(1.3)	(0.2)	(0.4)	(0.9)
W2*Log Ag Y	-0.900	-0.238	-0.043	-0.161	0.181
(t)	(3.6)	(1.3)	(0.3)	(0.5)	(1.3)
W2*Log Non-Ag Y	-0.576	-0.172	-0.027	-0.074	0.071
(t)	(3.8)	(1.6)	(0.3)	(0.4)	(0.9)
Net when W2=1					
[Ag]	[0.260]	[0.811]	[0.978]	[0.889]	[1.254]
[Non-Ag]	[0.450]	[0.827]	[0.954]	[0.938]	[1.059]
Countries*	12	18	16	3	24
Decades*	1	1	1	0	3
\hat{R}^2	0.922	0.966	0.978	0.904	0.989

/ continued . . .

Table 3. -- Continued.

Panel B: Sum of Weighted Elasticities Constrained to Equal One

	Quintile I (poorest)	Quintile II	Quintile III	Quintile IV	Quintile V (richest)
Constant	-1.622	-0.598	-0.085	0.084	0.944
(t)	(2.1)	(0.8)	(0.1)	(0.1)	(2.0)
Log Ag Y	1.146	1.028	0.994	1.013	1.008
(t)	(8.4)	(7.7)	(7.9)	(8.1)	(11.7)
Log Non-Ag Y	1.018	0.987	0.965	0.991	0.949
(t)	(12.6)	(12.5)	(12.5)	(13.4)	(18.1)
W2	5.032	1.213	0.054	0.653	-0.920
(t)	(4.8)	(1.2)	(0.1)	(0.7)	(1.6)
W2*Log Ag Y	-0.889	-0.221	-0.022	-0.135	0.216
(t)	(4.8)	(1.2)	(0.1)	(0.8)	(2.1)
W2*Log Non-Ag Y	-0.569	-0.163	-0.015	-0.059	0.090
(t)	(5.2)	(1.5)	(0.1)	(0.6)	(1.5)
Net when W2=1					
[Ag]	[0.257]	[0.807]	[0.972]	[0.878]	[1.224]
[Non-Ag]	[0.449]	[0.824]	[0.950]	[0.932]	[1.039]
Countries*	15	16	13	15	22
Decades*	1	1	1	1	3
\hat{R}^2	0.922	0.966	0.978	0.904	0.989

*Numbers for “Countries” and “Decades” indicate the number of variables in each category that are significant at 10 percent or higher.

¹ Agricultural value added per agricultural worker, in \$PPP, is used as a proxy for agricultural income and similarly for non-agriculture. The dummy variable W2 is set equal to one when the gap between per capita income of the top quintile and the bottom quintile exceeds twice the average per capita income, for that particular country and time period.

SOURCE: Author’s estimates from data in Deininger and Squire (1996).

The contrast with countries where the relative income gap is large--more than twice the average per capita income--is striking. In the poorest quintile, workers are virtually disconnected from the national economy. A 95 percent confidence interval includes zero for both sectors! The elasticity of connection rises sharply by income class and exceeds one for the top quintile. A regression similar to the one above shows no difference in the contribution from agriculture, and the elasticities rise significantly by quintile for all five groups (see Appendix E).

For countries with large income gaps, the "early" (and discouraging) part of the Kuznets curve is a dramatic reality of their economies. And growth in agricultural productivity is no more successful in alleviating poverty than growth in the non-agricultural economy. Indeed, the rich benefit considerably from agricultural growth in countries with large income gaps, no doubt because of highly skewed distributions of land. But neither sector reaches the poor very effectively.

These contrasting structures have immediate implications for the distribution of economic growth. Maintaining the previous experiment of an economy growing by 5 percent per year in per capita terms, for 25 years, it is possible to show the impact. Assume that agriculture grows by 3 percent per year in per capita terms, and non-agriculture grows fast enough for the overall economy to maintain its 5 percent growth rate each year. Because the share of agriculture will decline during this growth process--from 25 percent of GDP to 15 percent, as it turns out--the non-agricultural sector grows somewhat faster at the beginning than at the end. The average for the 25-year period is 5.5 percent per year per capita and the average share of agriculture over the period is 20 percent.

In economies with relatively small income gaps between rich and poor, this growth process increases the per capita incomes of the bottom quintile by 241 percent after 25 years. Incomes in the top quintile increase by 211 percent, so the "top quintile/bottom quintile" ratio actually falls from 5.10 to 4.65. The contrast with the growth process in economies with wide income gaps is stark. Incomes of the bottom quintile increase by just

73 percent over the 25 years, whereas incomes in the top quintile increase by 273 percent! The "top/bottom" ratio deteriorates from 13.1 at the start to 28.4 at the end. If these countries could sustain such rapid economic growth for 25 years, they would end up with a distribution of income about as bad as that in Brazil.

Insights on the Political Economy of Growth

These results raise intriguing possibilities about the political sustainability of rapid economic growth. Consider the same 25-year experiment with the distribution of economic growth conducted when the results were not disaggregated. Then the ratio of incomes in the top to bottom quintile rose from 7.8 to 10.3. Now it can be seen that the results depend dramatically on what kind of economy is growing. When the relative income gap is less than twice the level of average per capita incomes, economic growth is roughly equal in all income quintiles and is especially stimulated by growth in agricultural productivity (see Figure 4).

Alternatively, when the relative income gap exceeds twice the average per capita income, the poor are nearly left out of the growth process altogether, and agriculture is no more effective in reaching them than non-agriculture. These results suggest that the relatively good income distributions in some countries of East, Southeast, and South Asia produce a growth process that is more sustainable than in countries with highly skewed income distributions. The reasons are almost certainly political and may hinge importantly on the extent of political liberties and flexibility in the labor market. Economies with few political choices, low and stagnant labor productivity in agriculture, and structural rigidities in moving that labor to more productive sectors are likely to find a visibly growing income gap between the rich and the poor to be more destabilizing than in economies that are open and flexible (A. Timmer, 1997).

Evidence from the record of economic growth from 1965 to 1985 and from 1985 to 1995 provides a rough confirmation of this line of speculation (see Table 4). When the

difference in the rate of growth of per capita incomes between these two periods (GRDIFF, data from World Bank, 1987, 1997) is regressed on the average relative size of the income gap for each country (RELGAP, data from Table 1), the result is a large, negative coefficient that is significant at the one percent level. Controlling for the (logarithm of the) level of per capita income at the end of the period (LPCYPPP) and the growth rate in the first period (GR6585), a larger income gap is significantly associated with a sharp slowdown in the rate of economic growth from the first to the second period. Richer countries experience a smaller slowdown than poorer countries, suggesting that it is possible to "buy" political stability (A. Timmer, 1997). And controlling for the other two factors, a faster rate of economic growth in the first period is also associated with a slower rate in the second, suggesting that there is considerable "luck of the draw" in individual growth rates.

These political economy insights suggest that changes in relative incomes are more likely to influence political stability than changes in the degree of absolute poverty. Because Gini coefficients and "top quintile/bottom quintile" ratios rarely blend easily into populist speeches, the more visible measure of inequality is the gap between the rich and the poor. For the empirical analysis conducted here, this gap is measured by the difference between the incomes of the top and bottom quintiles and, because the data actually report on expenditure patterns rather than income patterns, this gap is likely to be quite visible to most citizens, at least in urban areas.

This measure of the relative gap is positively associated with the level of per capita incomes, confirming the "early" stage of the Kuznets curve for the countries in this sample (see Table 4, Panel B). For the countries and time period examined here, there is a very clear and significant tendency for the gap to widen with higher incomes per capita. Interestingly, countries able to grow fastest from 1985 to 1995 were associated with a narrowing of the income gap. This result again suggests the importance of the income gap to sustaining the growth process.

Table 4.--Impact of Relative Income Gap on Sustainability of Economic Growth

Panel A

LS // Dependent Variable is GRDIFF

Date: 12-20-1997 / Time: 16:22

SMPL range: 1 - 26

Number of observations: 26

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-12.679502	6.9472017	-1.8251236	0.0816
RELGAP	-3.5666252	1.2305196	-2.8984708	0.0083
LPCYPPP	2.7830532	0.9864252	2.8213524	0.0099
GR6585	-0.8505806	0.2598316	-3.2735837	0.0035
R-squared	0.411680	Mean of dependent var	0.511538	
Adjusted R-squared	0.331455	S.D. of dependent var	2.899838	
S.E. of regression	2.371041	Sum of squared resid	123.6804	
Log likelihood	-57.16726	F-statistic	5.131546	
Durbin-Watson stat	1.660520	Prob(F-statistic)	0.007665	

Panel B

LS // Dependent Variable is RELGAP

Date: 12-20-1997 / Time: 19:44

SMPL range: 1 - 26

Number of observations: 26

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	-1.3433654	0.9639306	-1.3936329	0.1768
LPCYPPP	0.4589901	0.1200291	3.8239916	0.0009
GR8595	-0.0820610	0.0256799	-3.1955312	0.0040
R-squared	0.433989	Mean of dependent var	2.219615	
Adjusted R-squared	0.384770	S.D. of dependent var	0.440804	
S.E. of regression	0.345751	Sum of squared resid	2.749510	
Log likelihood	-7.685642	F-statistic	8.817621	
Durbin-Watson stat	0.986970	Prob(F-statistic)	0.001437	

GRDIFF = Difference in rate of economic growth per capita between 1965-85
and 1985-95

RELGAP = Per capita income in Quintile V minus per capita income in Quintile I,
divided by average per capita income, all in \$PPP.

LPCYPPP = Logarithm of per capita income in 1995, in \$PPP.

GR6585 = Rate of growth of per capita incomes from 1965 to 1985.

GR8595 = Ditto, from 1985 to 1995.

The evidence presented here suggests that a gap that is twice as large as the average per capita income is an effective dividing line between societies with "good" and "bad" income distributions, with sharply different growth processes in the two types of economies. The dividing line is not particularly sensitive to a gap that is exactly 2.0 times the average income per capita. When all the results were re-estimated with values of 1.9 and 2.1, there was little change in the basic patterns. Large changes, to 1.5 or 2.5 for example, produce more significant changes in the results, partly because the sample size for the smaller sub-sample becomes too small to have much confidence in the coefficients. It is reasonable to conclude that when the income gap between the top and bottom quintiles exceeds twice the average per capita income, it is large enough for citizens to notice and to affect the political economy of the growth process.

The apparent failure of economic growth to reach the poor in precisely those environments where the connection would seem to be most crucial is clearly disappointing, but should not be taken as a council of despair or a general indictment of economic growth itself. Even in societies that start with a wide income gap, growth has a positive, although small, impact on the poor, and failure to grow will certainly hurt the poor. More positively, visible and pro-active measures to reach the poor as a concomitant part of trade opening, structural adjustment, and privatization programs designed to speed economic growth will help to sustain the growth-friendly initiatives. Perhaps the failure to sustain rapid economic growth in countries with wide (and widening) income gaps is no mystery when viewed in the context of these results.

References

- Alesina, Alberto, and Roberto Perotti. 1993. "Income Distribution, Political Instability, and Investment." Cambridge, MA: National Bureau of Economic Research (NBER) Working Paper no. 4486, October.
- Anand, Sudhir, and S. M. R. Kanbur. 1993. "The Kuznets Process and the Inequality-Development Relationship." *Journal of Development Economics.* vol. 40, no. 1, pp. 25-52.
- Barro, Robert J., and Xavier Sala-i-Martin. 1995. *Economic Growth.* New York: McGraw-Hill.
- Birdsall, Nancy, David Ross, and Richard Sabot. 1995. "Inequality and Growth Reconsidered: Lessons from East Asia." *World Bank Economic Review,* vol. 9, no. 3, pp. 477-508.
- Dasgupta, Partha. 1993. *An Inquiry into Well-Being and Destitution.* Oxford: Clarendon Press.
- Datt, Guarav, and Martin Ravallion. 1997. "Why Have Some Indian States Done Better Than Others at Reducing Rural Poverty?" *Economica,* vol. 64.
- Deininger, Klaus, and Lyn Squire. 1996. "A New Data Set Measuring Income Inequality." *The World Bank Economic Review.* vol. 10, no. 3 (September), pp. 565-591. Data available at
http://www.worldbank.org/html/prdmg/grwthweb/growth_t.htm
- Fields, Gary S. 1997. "Poverty, Inequality, and Economic Well-Being: African Economic Growth in Comparative Perspective," Paper prepared for presentation to the African Economic Research Consortium, Nairobi, Kenya, August, mimeo.
- Fogel, Robert. 1994. "Economic Growth, Population Theory, and Physiology: The Bearing of Long-Term Processes on the Making of Economic Policy." [Nobel Prize Lecture] *American Economic Review,* vol. 84, no. 3 (June), pp. 369-395.
- Gallup, John, Steven Radelet, and Andrew Warner. 1997. "Economic Growth and the Income of the Poor." Harvard Institute for International Development. Prepared for the CAER II Project, August, mimeo.
- Kuznets, Simon. 1955. "Economic Growth and Income Inequality." *American Economic Review.* vol. 49, no. 1, pp. 1-28.
- Lewis, W. Arthur. 1954. "Economic Development with Unlimited Supplies of Labor." *The Manchester School.* vol. 22, pp. 3-42.
- Larraín B., Felipe, and Rodrigo Vergara M. 1997. "Income Distribution, Investment, and Growth," Development Discussion Paper No. 596, August, Harvard Institute for International Development, Cambridge, MA, pp. 24.

- Larson, Donald, and Yair Mundlak. 1997. "On the Intersectoral Migration of Agricultural Labor." *Economic Development and Cultural Change*. vol. 45, no. 2 (January), pp. 295-319.
- Morduch, Jonathan. 1994. "Poverty and Vulnerability," *American Economic Review: Papers and Proceedings*, vol. 84, no. 2 (May), pp. 221-5.
- Perotti, Roberto. 1996. "Growth, Income Distribution, and Democracy: What the Data Say." *Journal of Economic Growth*, pp. 149-88.
- Ravallion, Martin. 1996. "Can High-Inequality Developing Countries Escape Absolute Poverty?" Policy Research Department, Mimeo, World Bank, Washington, DC., mimeo.
- _____ and Shaohua Chen. 1997. "What Can New Survey Data Tell Us about Recent Changes in Distribution and Poverty?" *The World Bank Economic Review*, vol. 11, no. 2, pp. 357-82.
- _____ and Guarav Datt. 1996. "How Important to India's Poor Is the Sectoral Composition of Economic Growth?" *The World Bank Economic Review*, vol. 10, no. 1, pp. 1-25.
- Roemer, Michael, and Mary Kay Gugerty. 1997. "Does Economic Growth Reduce Poverty?" CAER II Discussion Paper No. 4 (April). Cambridge, MA: Harvard Institute for International Development, pp. 42.
- Summers, Robert, and Alan Heston. 1991 (updated 1996). "The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988." *Quarterly Journal of Economics*. vol. 106, no. 2 (May), pp. 327-68.
- Timmer, Ashley S. 1997. "Exit Options and Political Stability." Paper presented to the Harvard/MIT Research and Training Group (RTG) Seminar in Positive Political Economy, October, pp. 33, mimeo.
- Timmer, C. Peter. 1988. "The Agricultural Transformation." In Hollis Chenery and T. N. Srinivasan, eds., *Handbook of Development Economics*, Vol. 1, Amsterdam: North-Holland, pp. 275-331.
- _____. 1995. "Getting Agriculture Moving: Do Markets Provide the Right Signals?" *Food Policy*, vol. 20, no. 5 (October), pp. 455-72.
- _____. 1996a. "Food Security Strategies: The Asian Experience." Prepared for a conference on food security in Central America sponsored by the Food and Agriculture Organization of the United Nations, September, 1996.
- _____. 1996b. "Agricultural Linkages to Economic Growth." Prepared for the Agricultural Policy Analysis Project (APAP) for the Africa Bureau of USAID, Harvard Institute for International Development, December, pp. 34, mimeo.
- World Bank. 1987. *World Development Report: Barriers to Adjustment and Growth in the World Economy*. New York: Oxford University Press for the World Bank.

_____. 1993. *The East Asian Miracle: Economic Growth and Public Policy*. New York: Oxford University Press for the World Bank.

_____. 1997. *World Development Report: The State in a Changing World*. New York: Oxford University Press for the World Bank.

Appendix A

Data on Income Distribution, by Country and Year

Country	Code	Year	Share of Income to Each Quintile					Real GDP					Agriculture		
			Q1	Q2	Q3	Q4	Q5	per cap	agric.	non-ag	% of GDP	% of LF	Rel Gap		
Bangladesh	BGD	1963	0.069	0.110	0.154	0.222	0.445	1066	714	2984	0.5662	0.8450	1.880		
Bangladesh	BGD	1967	0.079	0.117	0.158	0.223	0.423	1162	786	2935	0.5580	0.8250	1.720		
Bangladesh	BGD	1973	0.070	0.113	0.151	0.228	0.438	759	546	1543	0.5664	0.7867	1.840		
Bangladesh	BGD	1977	0.071	0.122	0.169	0.229	0.409	949	618	1951	0.4890	0.7514	1.688		
Bangladesh	BGD	1978	0.074	0.117	0.160	0.220	0.429	1010	738	1797	0.5425	0.7428	1.778		
Bangladesh	BGD	1981	0.066	0.107	0.152	0.221	0.453	1085	596	2395	0.3999	0.7281	1.934		
Bangladesh	BGD	1983	0.072	0.118	0.159	0.217	0.434	1069	600	2203	0.3968	0.7073	1.809		
Bangladesh	BGD	1986	0.070	0.124	0.151	0.196	0.460	1261	752	2328	0.4041	0.6772	1.952		
Bangladesh	BGD	1989	0.095	0.133	0.170	0.216	0.386	1375	789	2456	0.3720	0.6484	1.455		
Brazil	BRA	1960	0.032	0.069	0.109	0.191	0.599	1780	597	3062	0.1743	0.5200	2.835		
Brazil	BRA	1970	0.032	0.063	0.098	0.190	0.617	2427	667	3861	0.1235	0.4491	2.925		
Brazil	BRA	1972	0.020	0.050	0.094	0.170	0.666	2899	874	4435	0.1299	0.4312	3.230		
Brazil	BRA	1974	0.029	0.061	0.103	0.180	0.627	3451	1077	5129	0.1292	0.4141	2.990		
Brazil	BRA	1976	0.022	0.052	0.090	0.152	0.684	3773	1234	5450	0.1300	0.3977	3.310		
Brazil	BRA	1978	0.025	0.059	0.109	0.189	0.618	3881	1180	5550	0.1161	0.3820	2.965		
Brazil	BRA	1979	0.026	0.057	0.099	0.178	0.640	4074	1199	5794	0.1102	0.3743	3.070		
Brazil	BRA	1980	0.029	0.059	0.104	0.192	0.616	4297	1290	6039	0.1101	0.3668	2.935		
Brazil	BRA	1981	0.031	0.064	0.114	0.198	0.593	3992	1222	5487	0.1074	0.3506	2.810		
Brazil	BRA	1982	0.038	0.066	0.134	0.188	0.574	3965	1061	5428	0.0897	0.3351	2.682		
Brazil	BRA	1983	0.024	0.057	0.107	0.186	0.626	3752	1281	4916	0.1094	0.3203	3.010		
Brazil	BRA	1985	0.029	0.051	0.100	0.175	0.645	4017	1584	5023	0.1154	0.2926	3.080		
Brazil	BRA	1986	0.031	0.061	0.110	0.192	0.606	4294	1713	5296	0.1116	0.2797	2.875		
Brazil	BRA	1987	0.027	0.057	0.106	0.190	0.620	4319	1617	5305	0.1001	0.2673	2.965		
Brazil	BRA	1989	0.025	0.049	0.092	0.183	0.652	4272	1490	5171	0.0852	0.2442	3.135		
Chile	CHL	1968	0.045	0.090	0.138	0.213	0.514	3496	970	4347	0.0699	0.2520	2.345		
Chile	CHL	1971	0.043	0.088	0.135	0.211	0.523	3889	1291	4699	0.0789	0.2376	2.400		
China	CHN	1980	0.079	0.123	0.184	0.247	0.367	971	387	2780	0.3009	0.7558	1.437		
China	CHN	1982	0.085	0.137	0.179	0.223	0.376	963	426	2587	0.3327	0.7516	1.457		
China	CHN	1983	0.087	0.146	0.170	0.243	0.355	1027	453	2746	0.3304	0.7496	1.343		
China	CHN	1984	0.101	0.136	0.191	0.232	0.341	1134	486	3053	0.3201	0.7475	1.199		
China	CHN	1985	0.087	0.129	0.163	0.234	0.388	1262	480	3552	0.2835	0.7454	1.502		
China	CHN	1986	0.076	0.119	0.160	0.259	0.386	1239	452	3520	0.2709	0.7434	1.552		
China	CHN	1987	0.069	0.111	0.160	0.284	0.376	1262	456	3572	0.2679	0.7413	1.533		
China	CHN	1988	0.066	0.109	0.161	0.288	0.375	1326	460	3780	0.2566	0.7393	1.546		
China	CHN	1989	0.065	0.116	0.159	0.241	0.420	1352	459	3858	0.2500	0.7372	1.779		
China	CHN	1990	0.070	0.119	0.161	0.240	0.410	1324	487	3647	0.2705	0.7352	1.699		
China	CHN	1991	0.064	0.114	0.149	0.313	0.361	1378	459	3913	0.2446	0.7340	1.481		
China	CHN	1992	0.060	0.107	0.158	0.258	0.417	1494	444	4361	0.2177	0.7320	1.782		
Ivory Coast	CIV	1985	0.057	0.101	0.149	0.219	0.474	1545	649	3027	0.2618	0.6232	2.087		
Ivory Coast	CIV	1986	0.070	0.106	0.149	0.213	0.462	1558	697	2953	0.2765	0.6184	1.960		
Ivory Coast	CIV	1987	0.065	0.105	0.148	0.212	0.470	1522	709	2814	0.2856	0.6136	2.028		
Ivory Coast	CIV	1988	0.068	0.112	0.158	0.222	0.441	1425	732	2503	0.3129	0.6088	1.865		

Country	Code	Year	Share of Income to Each Quintile					Real GDP					Agriculture				
			Q1	Q2	Q3	Q4	Q5	per cap	agric.	non-ag	% of GDP	% of LF	Rel.	Gap			
Columbia	COL	1970	0.070	0.079	0.101	0.148	0.602	2140	1298	2734	0.2509	0.4135	2.662				
Columbia	COL	1971	0.041	0.070	0.115	0.197	0.577	2236	1274	2912	0.2352	0.4127	2.680				
Columbia	COL	1972	0.041	0.070	0.113	0.191	0.585	2339	1371	3017	0.2413	0.4118	2.721				
Columbia	COL	1974	0.047	0.089	0.133	0.199	0.532	2516	1496	3225	0.2438	0.4100	2.425				
Columbia	COL	1978	0.031	0.073	0.117	0.191	0.588	2800	1587	3631	0.2304	0.4065	2.783				
Columbia	COL	1988	0.037	0.080	0.125	0.199	0.559	3231	1954	3720	0.1675	0.2769	2.610				
Columbia	COL	1991	0.036	0.088	0.129	0.204	0.544	3300	2217	3651	0.1646	0.2450	2.538				
Costa Rica	CRI	1961	0.062	0.076	0.095	0.017	0.750	2112	1077	3156	0.2559	0.5020	3.440				
Costa Rica	CRI	1971	0.054	0.093	0.137	0.210	0.506	2974	1435	4084	0.2022	0.4190	2.260				
Costa Rica	CRI	1977	0.028	0.080	0.130	0.212	0.550	3646	2144	4536	0.2189	0.3722	2.610				
Costa Rica	CRI	1981	0.033	0.084	0.141	0.228	0.514	3419	2309	3993	0.2302	0.3408	2.405				
Costa Rica	CRI	1983	0.045	0.093	0.138	0.206	0.518	3081	2112	3539	0.2200	0.3210	2.365				
Costa Rica	CRI	1986	0.044	0.105	0.150	0.215	0.486	3273	2331	3664	0.2090	0.2934	2.210				
Costa Rica	CRI	1989	0.040	0.091	0.143	0.219	0.507	3451	2063	3960	0.1603	0.2682	2.335				
Dominican Rep.	DOM	1984	0.054	0.094	0.140	0.234	0.478	2157	1371	2481	0.1854	0.2917	2.120				
Dominican Rep.	DOM	1989	0.042	0.079	0.125	0.197	0.557	2430	1698	2680	0.1783	0.2551	2.575				
Ghana	GHA	1988	0.069	0.116	0.161	0.221	0.432	811	668	1027	0.4961	0.6022	1.815				
Ghana	GHA	1989	0.070	0.113	0.158	0.218	0.441	821	669	1049	0.4897	0.6007	1.859				
Ghana	GHA	1992	0.079	0.120	0.161	0.218	0.422	956	779	1217	0.4856	0.5960	1.715				
Guatemala	GTM	1987	0.027	0.063	0.107	0.182	0.621	2104	1035	3301	0.2598	0.5282	2.970				
Guatemala	GTM	1989	0.021	0.058	0.105	0.186	0.630	2137	1042	3349	0.2563	0.5255	3.045				
Honduras	HND	1968	0.016	0.048	0.095	0.188	0.653	1203	738	2106	0.4049	0.6600	3.185				
Honduras	HND	1992	0.038	0.080	0.123	0.195	0.563	1383	751	1756	0.2013	0.3710	2.625				
Indonesia	IDN	1976	0.080	0.116	0.160	0.220	0.425	981	476	1773	0.2965	0.6107	1.724				
Indonesia	IDN	1978	0.080	0.101	0.148	0.218	0.453	1124	531	1992	0.2810	0.5943	1.866				
Indonesia	IDN	1980	0.073	0.123	0.160	0.222	0.423	1282	522	2369	0.2397	0.5886	1.749				
Indonesia	IDN	1981	0.077	0.127	0.156	0.218	0.421	1480	590	2742	0.2336	0.5863	1.719				
Indonesia	IDN	1984	0.083	0.125	0.153	0.220	0.420	1609	632	2956	0.2275	0.5795	1.686				
Indonesia	IDN	1987	0.080	0.129	0.156	0.218	0.417	1703	695	3053	0.2339	0.5727	1.684				
Indonesia	IDN	1990	0.092	0.121	0.162	0.206	0.420	1973	677	3664	0.1941	0.5660	1.638				
Indonesia	IDN	1996	0.084	0.123	0.163	0.216	0.414	769	486	1574	0.4677	0.7400	1.650				
India	IND	1961	0.081	0.122	0.164	0.218	0.415	763	472	1578	0.4562	0.7370	1.670				
India	IND	1962	0.084	0.124	0.163	0.216	0.413	773	461	1634	0.4375	0.7340	1.645				
India	IND	1963	0.089	0.129	0.166	0.218	0.398	834	505	1727	0.4430	0.7310	1.545				
India	IND	1964	0.088	0.127	0.167	0.218	0.400	863	548	1706	0.4624	0.7280	1.560				
India	IND	1965	0.088	0.127	0.166	0.219	0.400	760	457	1559	0.4358	0.7250	1.560				
India	IND	1966	0.084	0.129	0.168	0.221	0.398	651	410	1277	0.4547	0.7220	1.570				
India	IND	1967	0.086	0.130	0.169	0.220	0.395	698	472	1277	0.4860	0.7190	1.605				
India	IND	1968	0.085	0.126	0.165	0.218	0.406	724	1381	0.4583	0.7160	1.585					
India	IND	1969	0.086	0.127	0.166	0.218	0.403	759	483	1444	0.4539	0.7130	1.585				
India	IND	1970	0.088	0.130	0.168	0.219	0.395	801	512	1495	0.4517	0.7063	1.535				
India	IND	1972	0.085	0.126	0.165	0.218	0.406	786	484	1504	0.4337	0.7041	1.605				

Country	Code	Year	Share of Income to Each Quintile					Real GDP			Agriculture		
			Q1	Q2	Q3	Q4	Q5	per cap	agric.	non-ag	% of GDP	% of LF	Rel Gap
India	IND	1973	0.090	0.131	0.172	0.226	0.381	786	521	1412	0.4663	0.7030	1.455
India	IND	1977	0.085	0.125	0.164	0.217	0.409	859	491	1712	0.3993	0.6986	1.620
India	IND	1983	0.086	0.127	0.165	0.217	0.405	986	524	1966	0.3615	0.6797	1.595
India	IND	1986	0.085	0.125	0.164	0.215	0.411	1092	522	2212	0.3170	0.6628	1.630
India	IND	1987	0.089	0.125	0.163	0.213	0.410	1123	535	2250	0.3133	0.6573	1.605
India	IND	1988	0.090	0.127	0.164	0.214	0.405	1204	597	2340	0.3234	0.6518	1.575
India	IND	1989	0.091	0.129	0.166	0.217	0.397	1235	594	2407	0.3109	0.6464	1.530
India	IND	1990	0.091	0.131	0.169	0.218	0.391	1262	610	2427	0.3097	0.6410	1.500
India	IND	1991	0.090	0.125	0.159	0.207	0.419	1252	615	2365	0.3126	0.6360	1.645
India	IND	1992	0.088	0.125	0.162	0.214	0.411	1284	623	2414	0.3063	0.6310	1.615
Jamaica	JAM	1975	0.041	0.090	0.142	0.224	0.503	2914	668	3976	0.0736	0.3211	2.310
Jamaica	JAM	1988	0.054	0.098	0.145	0.213	0.490	2442	684	3046	0.0716	0.2557	2.181
Jamaica	JAM	1989	0.051	0.095	0.144	0.220	0.490	2530	703	3137	0.0693	0.2494	2.195
Jamaica	JAM	1990	0.060	0.099	0.145	0.213	0.484	2543	676	3143	0.0647	0.2433	2.120
Jamaica	JAM	1991	0.058	0.102	0.149	0.216	0.475	2440	702	2983	0.0684	0.2380	2.082
South Korea	KOR	1965	0.058	0.135	0.155	0.233	0.418	1046	670	1505	0.3525	0.5500	1.801
South Korea	KOR	1966	0.065	0.119	0.170	0.240	0.406	1156	701	1686	0.3263	0.5380	1.705
South Korea	KOR	1968	0.086	0.128	0.169	0.225	0.392	1333	676	2028	0.2605	0.5140	1.530
South Korea	KOR	1969	0.084	0.130	0.173	0.231	0.382	1458	763	2158	0.2628	0.5020	1.490
South Korea	KOR	1970	0.073	0.123	0.163	0.224	0.418	1677	866	2461	0.2537	0.4914	1.716
South Korea	KOR	1971	0.072	0.115	0.158	0.221	0.434	1812	991	2563	0.2613	0.4778	1.810
South Korea	KOR	1976	0.057	0.112	0.154	0.224	0.453	2556	1414	3367	0.2297	0.4152	1.982
South Korea	KOR	1980	0.051	0.110	0.159	0.226	0.454	3093	1211	4204	0.1453	0.3711	2.016
South Korea	KOR	1982	0.070	0.118	0.162	0.220	0.430	3395	1510	4288	0.1430	0.3215	1.802
South Korea	KOR	1985	0.068	0.137	0.160	0.216	0.419	4217	2031	4982	0.1249	0.2592	1.755
South Korea	KOR	1988	0.074	0.123	0.163	0.218	0.422	5606	2737	6364	0.1020	0.2090	1.743
Sri Lanka	LKA	1963	0.045	0.092	0.138	0.202	0.523	1207	699	1864	0.3268	0.5640	2.393
Sri Lanka	LKA	1970	0.069	0.109	0.153	0.220	0.449	1240	635	1987	0.2830	0.5525	1.900
Sri Lanka	LKA	1973	0.072	0.119	0.162	0.216	0.432	1252	630	1988	0.2730	0.5422	1.803
Sri Lanka	LKA	1979	0.057	0.103	0.143	0.198	0.499	1548	799	2366	0.2694	0.5221	2.207
Sri Lanka	LKA	1980	0.079	0.175	0.175	0.204	0.368	1635	864	2475	0.2755	0.5215	1.448
Sri Lanka	LKA	1981	0.057	0.096	0.134	0.194	0.519	1632	872	2450	0.2770	0.5184	2.309
Sri Lanka	LKA	1987	0.051	0.091	0.134	0.201	0.524	2040	1099	2982	0.2696	0.5004	2.367
Sri Lanka	LKA	1990	0.089	0.131	0.169	0.217	0.393	2096	1122	3038	0.2632	0.4916	1.521
Morocco	MAR	1984	0.066	0.111	0.153	0.209	0.462	1908	559	3321	0.1500	0.5117	1.979
Morocco	MAR	1991	0.066	0.105	0.150	0.217	0.463	2244	1032	3185	0.2010	0.4370	1.987
Mexico	MEX	1963	0.036	0.056	0.093	0.174	0.641	3013	929	5243	0.1595	0.5170	3.025
Mexico	MEX	1968	0.028	0.051	0.105	0.179	0.637	3760	1004	6126	0.1234	0.4620	3.045
Mexico	MEX	1975	0.026	0.054	0.097	0.162	0.661	4928	1330	7316	0.1076	0.3989	3.175
Mexico	MEX	1977	0.029	0.074	0.132	0.220	0.545	4902	1299	7150	0.1018	0.3842	2.580
Mexico	MEX	1984	0.041	0.078	0.123	0.199	0.559	5524	1443	7534	0.0862	0.3299	2.590
Mexico	MEX	1989	0.032	0.070	0.115	0.190	0.593	5566	1470	7239	0.0766	0.2900	2.805

Year	Country	Share of Income to Each Quintile					Real GDP			Agriculture		
		Q1	Q2	Q3	Q4	Q5	per cap	agr.c.	non-ag	% of GDP	% of LF	Rel Gap
1970	MYS	0.040	0.077	0.123	0.198	0.562	2154	1143	3328	0.2852	0.5374	2.610
1976	MYS	0.033	0.078	0.118	0.198	0.573	2854	1678	3838	0.2678	0.4555	2.700
1979	MYS	0.037	0.082	0.125	0.198	0.558	3477	1963	4571	0.2367	0.4193	2.605
1984	MYS	0.042	0.086	0.132	0.208	0.532	4423	2463	5468	0.1936	0.3477	2.450
1989	MYS	0.046	0.083	0.130	0.204	0.537	4671	3159	5272	0.1925	0.2846	2.458
1964	OAN	0.079	0.125	0.162	0.220	0.415	1535	832	2273	0.2774	0.5120	1.678
1966	OAN	0.078	0.122	0.163	0.223	0.414	1726	909	2504	0.2571	0.4880	1.677
1968	OAN	0.088	0.134	0.171	0.225	0.382	1944	993	2767	0.2371	0.4640	1.468
1970	OAN	0.086	0.133	0.171	0.225	0.386	2185	962	3146	0.1936	0.4400	1.501
1972	OAN	0.088	0.135	0.170	0.221	0.386	2621	999	3739	0.1555	0.4080	1.490
1974	OAN	0.089	0.136	0.175	0.227	0.373	3004	1272	4048	0.1592	0.3760	1.418
1976	OAN	0.090	0.135	0.173	0.226	0.377	3345	1437	4346	0.1477	0.3440	1.436
1977	OAN	0.089	0.137	0.175	0.227	0.372	3570	1516	4572	0.1393	0.3280	1.414
1978	OAN	0.086	0.137	0.175	0.227	0.375	3920	1600	4972	0.1274	0.3120	1.444
1979	OAN	0.088	0.139	0.177	0.228	0.368	4249	1697	5322	0.1182	0.2960	1.399
1980	OAN	0.088	0.138	0.176	0.228	0.370	4458	1709	5527	0.1073	0.2800	1.412
1981	OAN	0.087	0.138	0.176	0.227	0.373	4593	1705	5683	0.1017	0.2740	1.429
1969	PAK	0.092	0.129	0.165	0.214	0.401	947	595	1458	0.3720	0.5920	1.546
1970	PAK	0.092	0.131	0.168	0.215	0.394	1029	644	1579	0.3683	0.5884	1.512
1971	PAK	0.089	0.127	0.164	0.212	0.408	972	586	1526	0.3553	0.5894	1.591
1979	PAK	0.086	0.125	0.163	0.214	0.413	1055	537	1823	0.3041	0.5974	1.635
1985	PAK	0.085	0.123	0.162	0.215	0.414	1262	611	2197	0.2853	0.5895	1.642
1986	PAK	0.082	0.125	0.166	0.221	0.407	1280	605	2227	0.2762	0.5839	1.625
1987	PAK	0.085	0.125	0.164	0.217	0.410	1309	594	2290	0.2625	0.5784	1.625
1988	PAK	0.086	0.128	0.166	0.216	0.404	1371	623	2375	0.2602	0.5730	1.589
1991	PAK	0.084	0.129	0.169	0.222	0.397	1394	642	2339	0.2566	0.5570	1.565
1961	PHL	0.042	0.079	0.121	0.193	0.565	1153	463	2348	0.2545	0.6340	2.615
1965	PHL	0.035	0.125	0.080	0.200	0.560	1243	532	2355	0.2611	0.6100	2.625
1971	PHL	0.036	0.081	0.133	0.210	0.540	1432	757	2338	0.3031	0.5731	2.520
1985	PHL	0.052	0.091	0.133	0.203	0.521	1542	779	2264	0.2458	0.4864	2.345
1988	Philippines	0.052	0.091	0.133	0.199	0.525	1674	826	2413	0.2296	0.4656	2.365
1992	Philippines	0.042	0.087	0.121	0.215	0.498	992	370	4071	0.3106	0.8320	2.089
1996	Philippines	0.051	0.101	0.143	0.204	0.501	1406	513	5069	0.2934	0.8040	2.247
1998	Philippines	0.049	0.101	0.148	0.218	0.484	1686	602	4977	0.2687	0.7523	2.174
1981	THA	0.043	0.094	0.139	0.213	0.511	2217	675	5843	0.2136	0.7016	2.340
1986	THA	0.042	0.087	0.131	0.209	0.531	2510	591	6329	0.1566	0.6655	2.445
1988	THA	0.041	0.085	0.128	0.204	0.542	2971	738	7148	0.1618	0.6516	2.505
1990	THA	0.040	0.083	0.125	0.200	0.552	3570	713	8606	0.1274	0.6380	2.560
1992	THA	0.037	0.076	0.116	0.186	0.585	3924	773	9176	0.1231	0.6250	2.740
1995	TUN	0.057	0.100	0.148	0.205	0.490	1232	434	2380	0.2080	0.5900	2.165
1999	TUN	0.059	0.104	0.153	0.221	0.463	2909	1645	3395	0.1572	0.2779	2.024
1968	TUR	0.030	0.070	0.100	0.200	0.600	2106	1154	4629	0.3977	0.7260	2.850

Country	Code	Year	Share of Income to Each Quintile					Real GDP				Agriculture		
			Q1	Q2	Q3	Q4	Q5	per cap	agric.	non-ag	% of GDP	% of LF	Rel Gap	
Turkey	TUR	1973	0.035	0.080	0.125	0.195	0.565	2472	1260	4979	0.3435	0.6741	2.650	
Turkey	TUR	1987	0.052	0.096	0.141	0.212	0.499	3441	1144	6266	0.1834	0.5515	2.235	
Uganda	UGA	1989	0.085	0.121	0.160	0.215	0.419	548	336	3173	0.5679	0.9254	1.671	
Uganda	UGA	1992	0.068	0.103	0.144	0.204	0.481	547	303	3468	0.5118	0.9230	2.068	
Venezuela	VEN	1971	0.036	0.094	0.142	0.208	0.520	7576	1786	9461	0.0579	0.2456	2.420	
Venezuela	VEN	1976	0.048	0.092	0.145	0.238	0.477	7777	1960	9087	0.0463	0.1838	2.145	
Venezuela	VEN	1977	0.048	0.098	0.148	0.230	0.475	8140	2317	9362	0.0494	0.1734	2.133	
Venezuela	VEN	1978	0.051	0.097	0.180	0.220	0.452	8233	2473	9360	0.0492	0.1636	2.003	
Venezuela	VEN	1979	0.050	0.114	0.154	0.254	0.428	8076	2524	9090	0.0483	0.1544	1.886	
Venezuela	VEN	1981	0.050	0.097	0.147	0.224	0.482	7197	2433	8005	0.0490	0.1450	2.160	
Venezuela	VEN	1987	0.047	0.092	0.140	0.215	0.506	6483	3079	6986	0.0611	0.1287	2.294	
Venezuela	VEN	1989	0.048	0.095	0.144	0.219	0.494	5919	2915	6343	0.0609	0.1237	2.230	
Venezuela	VEN	1990	0.036	0.071	0.117	0.193	0.584	6070	2701	6535	0.0540	0.1213	2.740	
Summary Statistics for Whole Sample														
Mean		1979	0.061	0.104	0.146	0.212	0.477	2393	1021	3636	0.2487	0.5125	2.079	
Median		1980	0.065	0.109	0.152	0.216	0.453	1726	752	3137	0.2509	0.5282	1.960	
SD		9.041	0.022	0.026	0.024	0.025	0.086	1656	616	1895	0.1274	0.1859	0.532	
Min		1960	0.016	0.048	0.080	0.017	0.341	547	303	1027	0.0463	0.1213	1.199	
Max		1992	0.101	0.175	0.191	0.313	0.750	8233	3159	9461	0.5679	0.9254	3.440	
Summary Statistics for wgt2=1														
Mean		1979	0.042	0.081	0.126	0.199	0.552	3237	1298	4629	0.1793	0.4201	2.560	
Median		1981	0.041	0.083	0.130	0.200	0.544	2971	1199	4204	0.1675	0.3989	2.549	
SD		8.885	0.012	0.017	0.019	0.026	0.062	1678	658	1942	0.0942	0.1745	0.351	
Min		1960	0.016	0.048	0.080	0.017	0.452	547	303	1756	0.0463	0.1213	2.003	
Max		1992	0.080	0.125	0.180	0.238	0.750	8233	3159	9461	0.5679	0.9230	3.440	
Summary Statistics for wgt2=0														
Mean		1979	0.080	0.124	0.164	0.224	0.408	1611	764	2716	0.3129	0.5980	1.639	
Median		1980	0.084	0.125	0.163	0.220	0.409	1262	613	2401	0.2909	0.6055	1.625	
SD		9.22	0.010	0.010	0.008	0.017	0.026	1190	442	1299	0.1207	0.1528	0.162	
Min		1960	0.050	0.101	0.148	0.196	0.341	548	336	1027	0.0483	0.1544	1.199	
Max		1992	0.101	0.175	0.191	0.313	0.463	8076	2737	9090	0.5679	0.9254	1.987	

Appendix B

Time-Series Relationships Between Various Measures of Average Income and Income Distribution, by Country

RGDP pc = Real GDP per capita, in 1993 \$PPP

RGDP pc Q1 = Real GDP per capita in 1993 \$PPP of Quintile 1

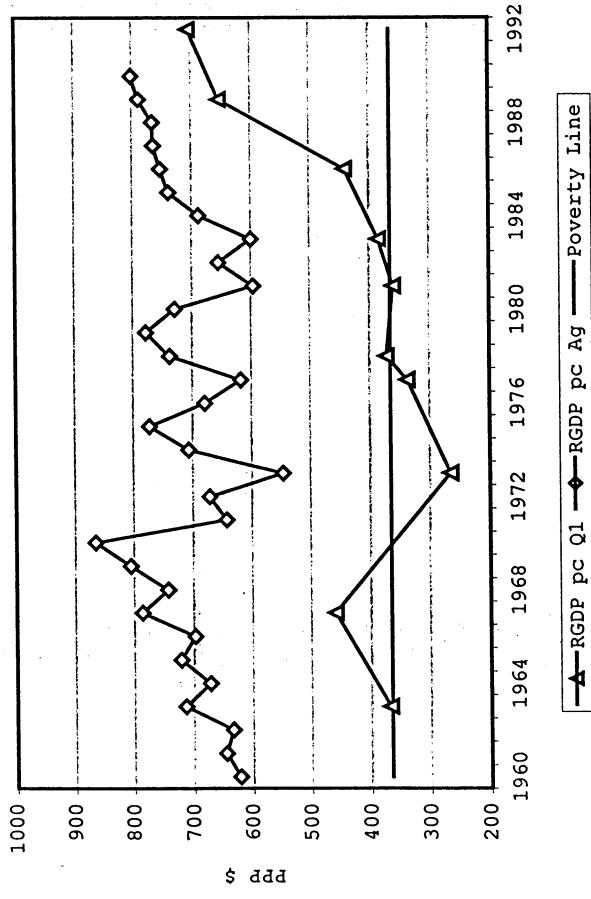
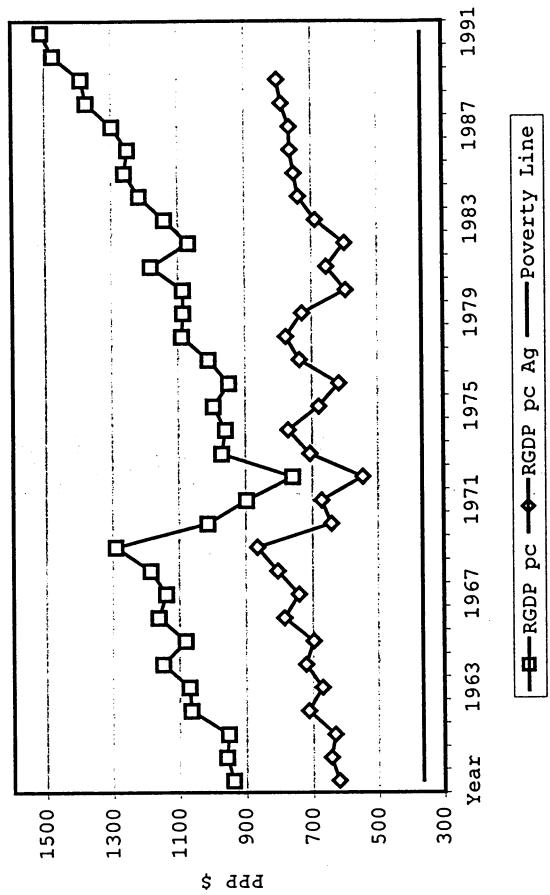
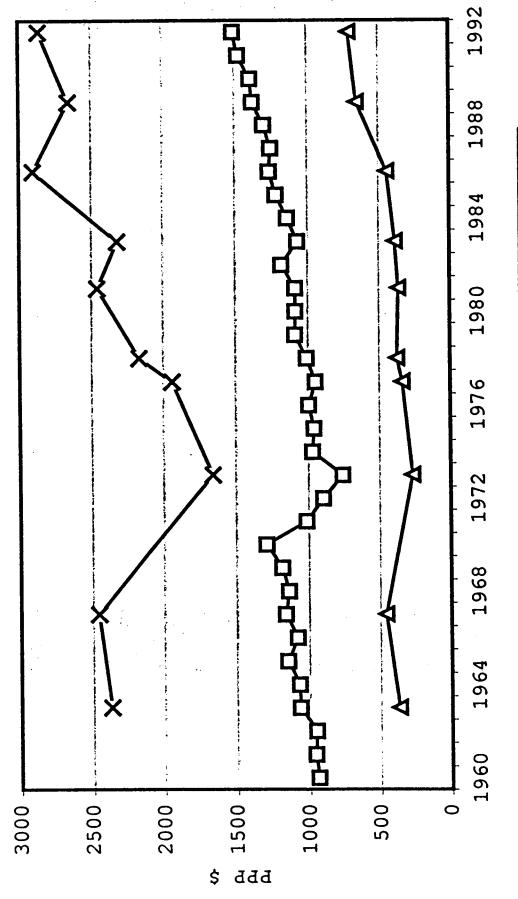
RGDP pc Q5 = Real GDP per capita in 1993 \$PPP of Quintile 5

RGDP pc Ag = Real GDP per capita in 1993 \$PPP of Agricultural Sector

Poverty Line = \$PPP 365 (one dollar per day)

Income Gap = (RGDP pc Q5) minus (RGDP pc Q1)

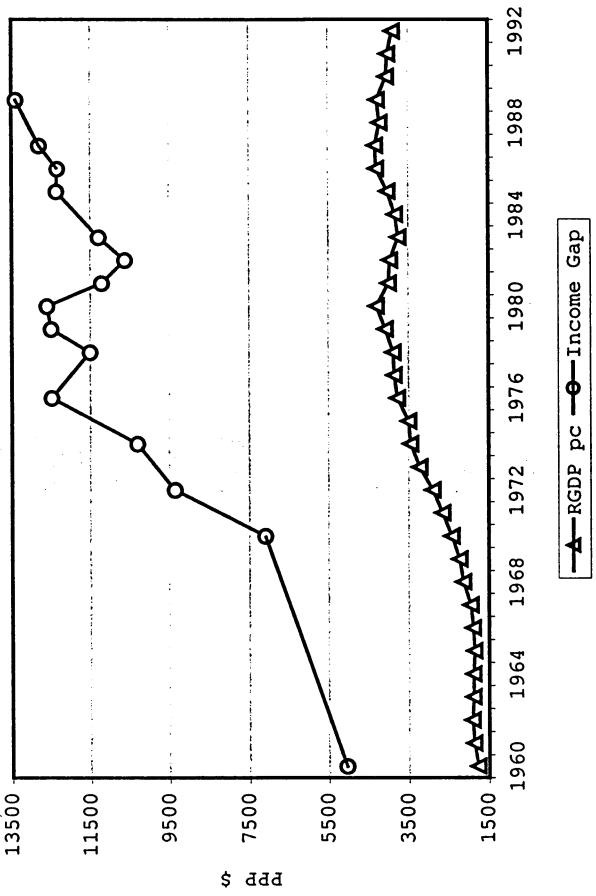
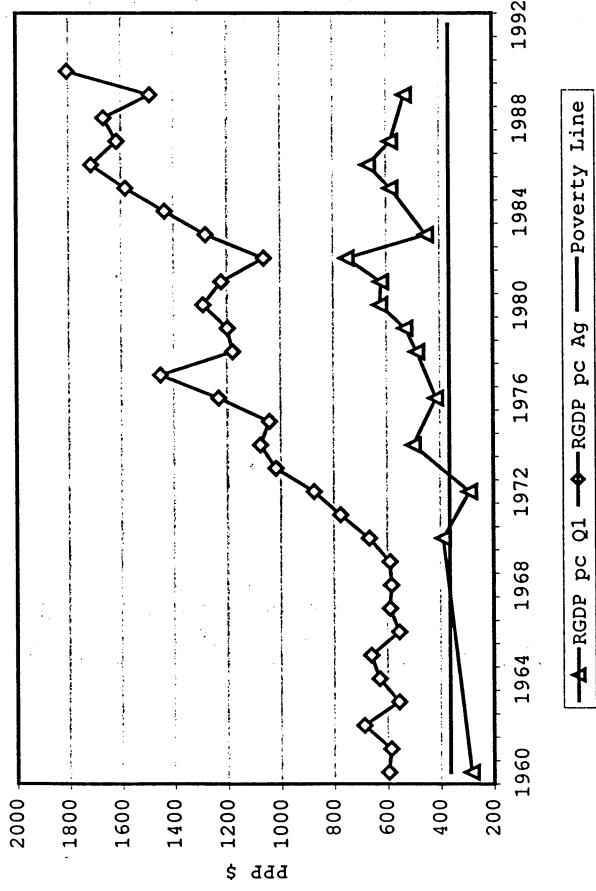
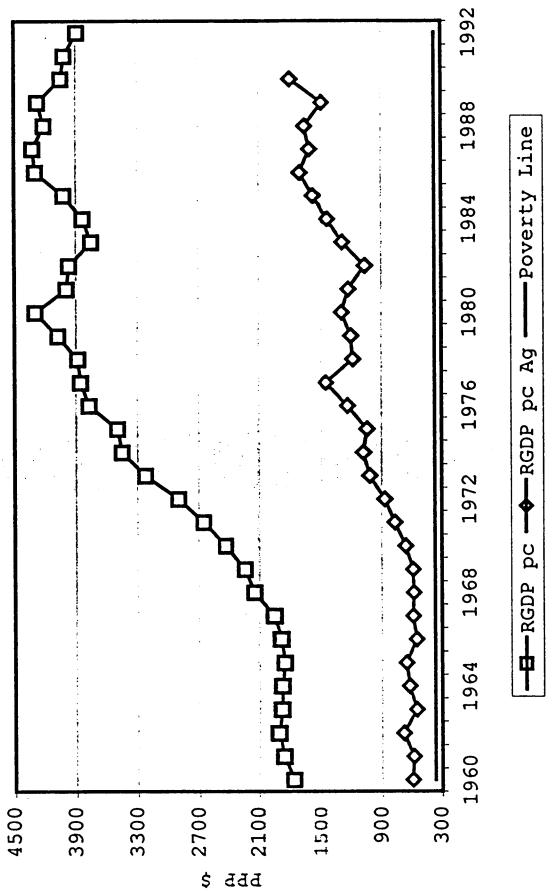
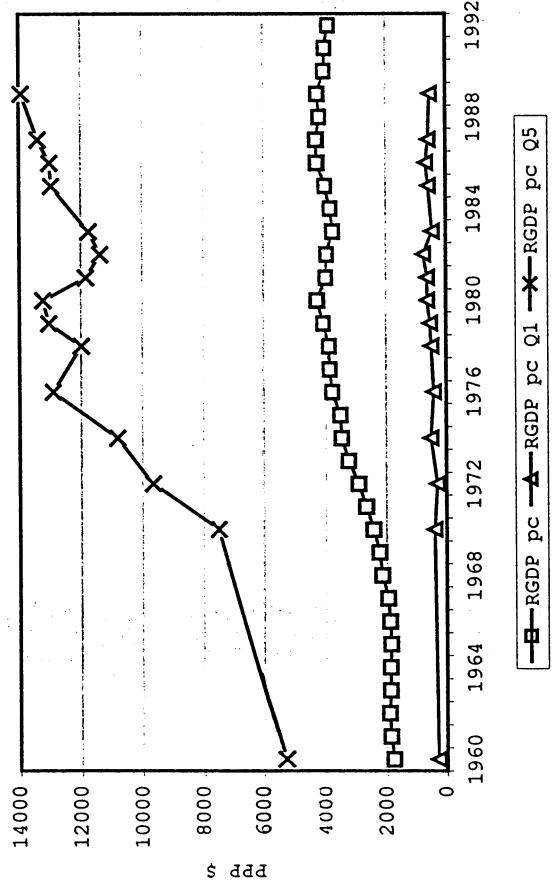
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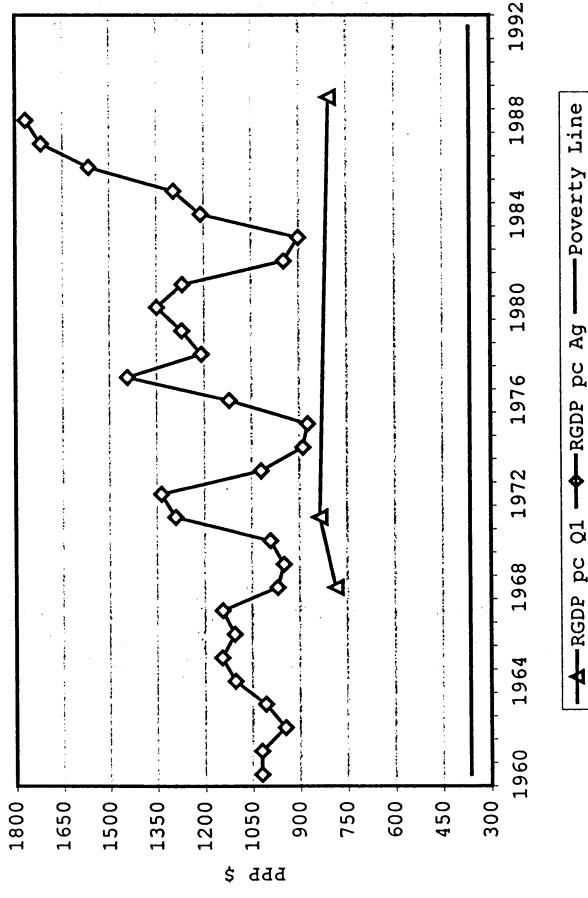
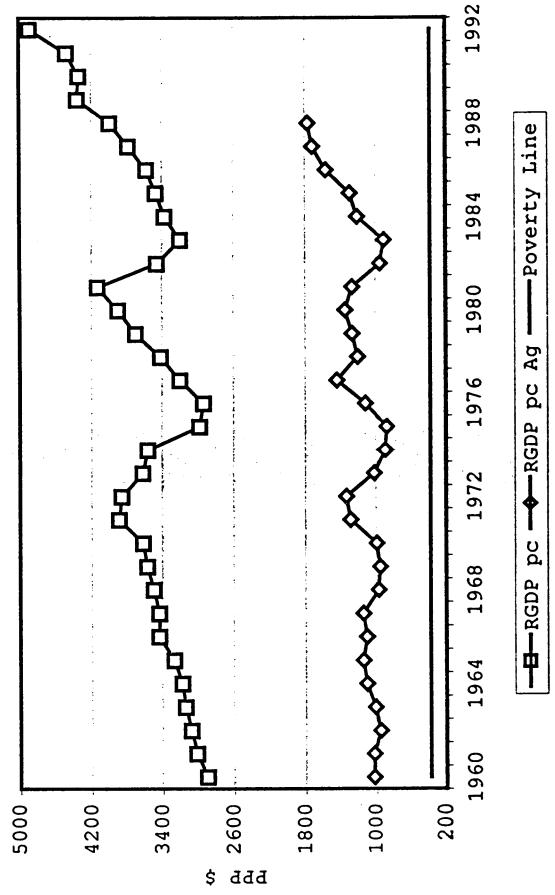
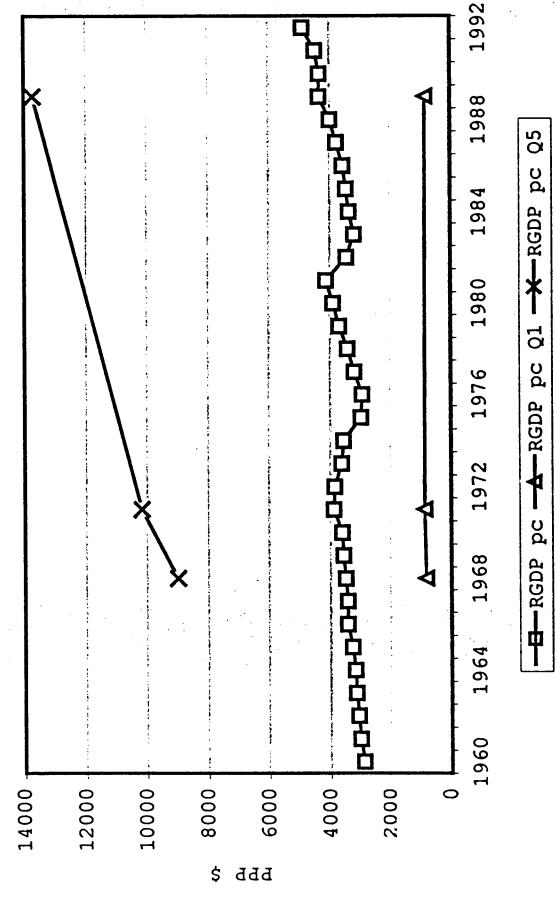
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—▲— RGDP pc —◆— RGDP pc Ag —○— Poverty Line

Brazil



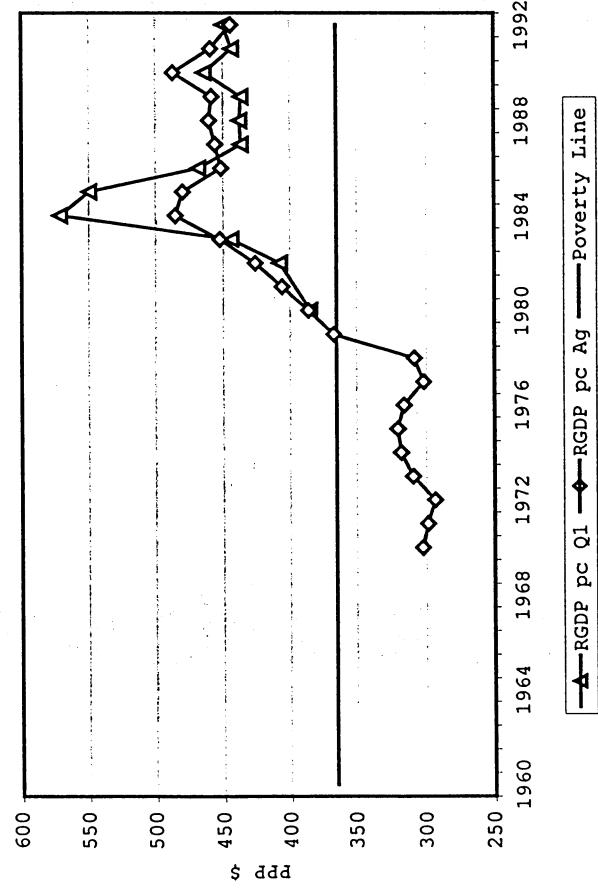
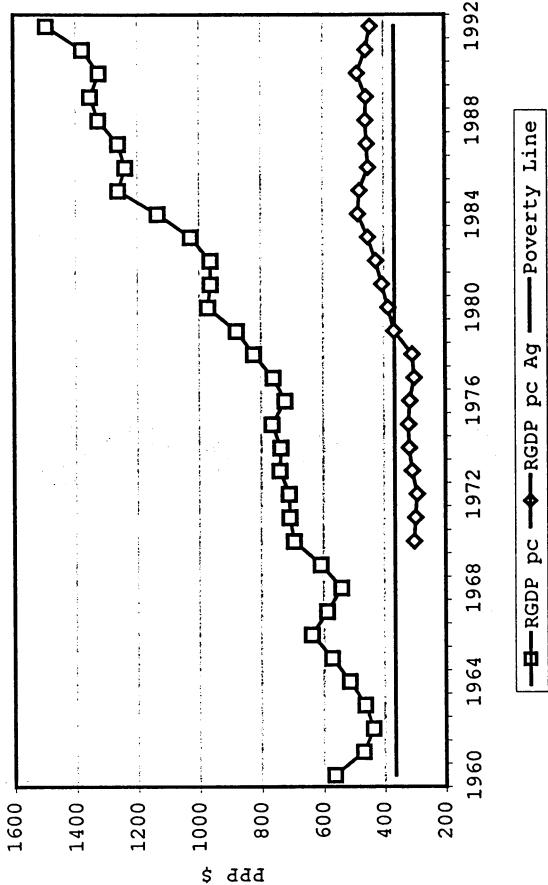
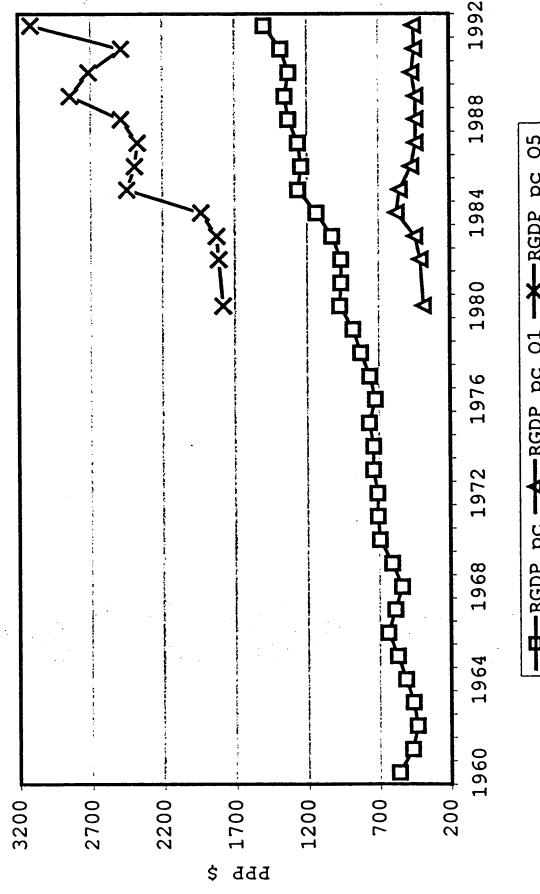
Chile



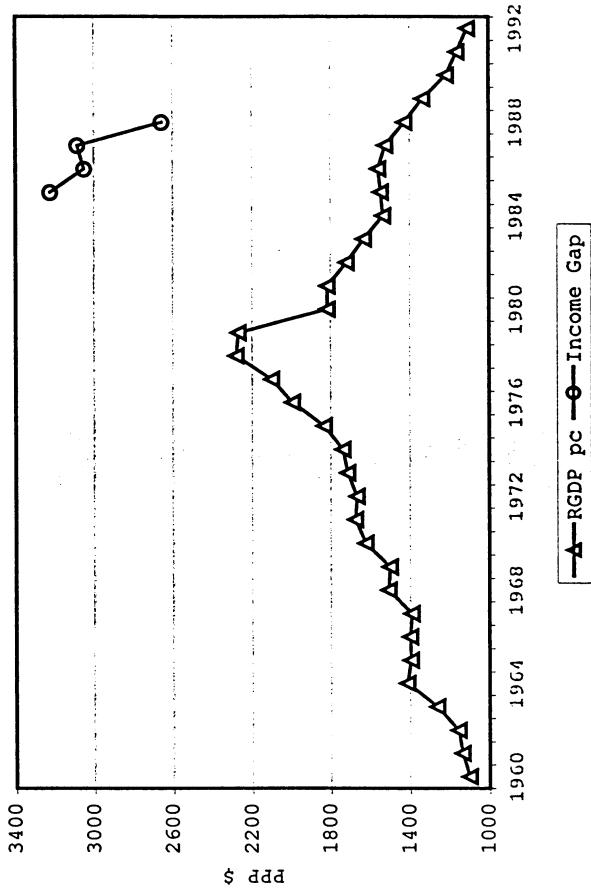
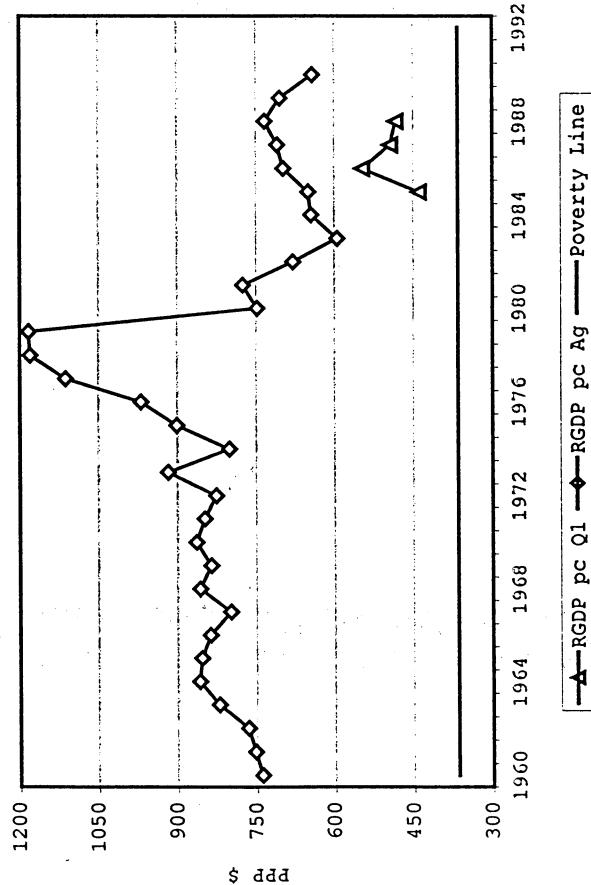
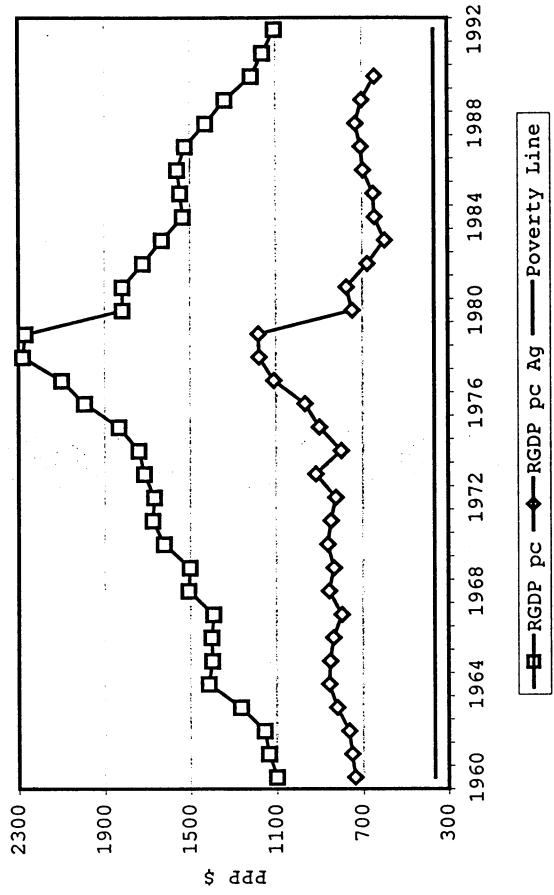
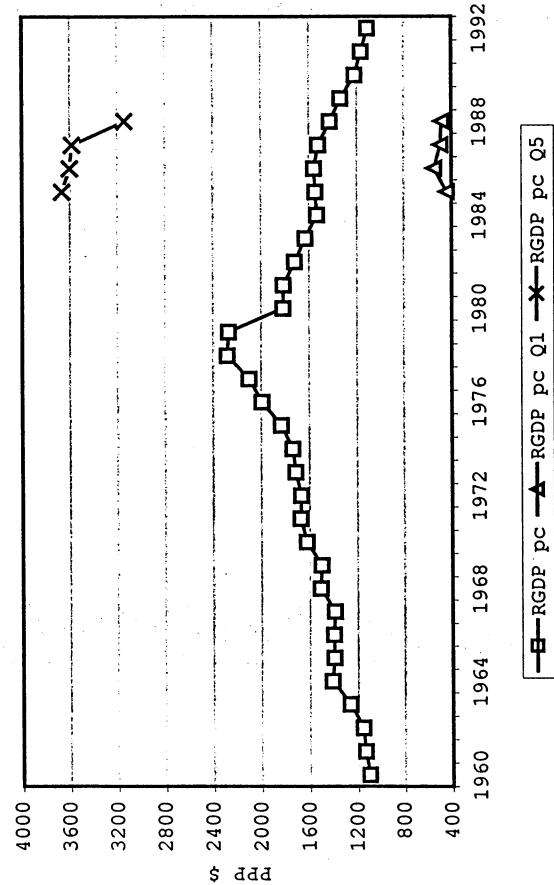
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—△— RGDP pc Q5 —●— RGDP pc Ag ——— Poverty Line

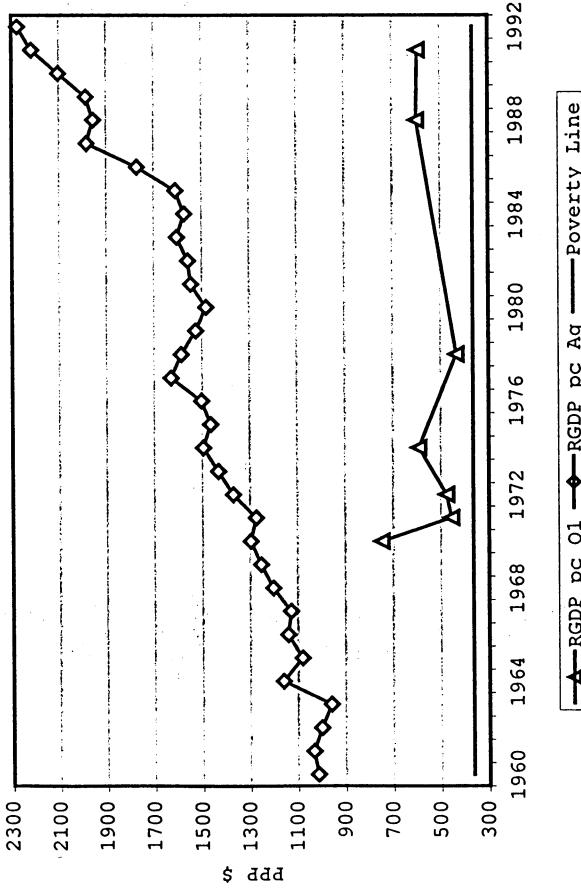
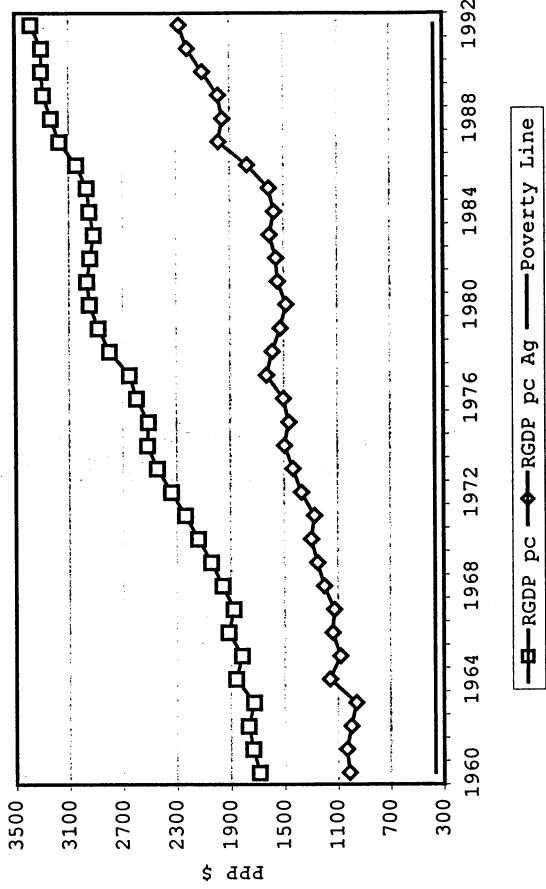
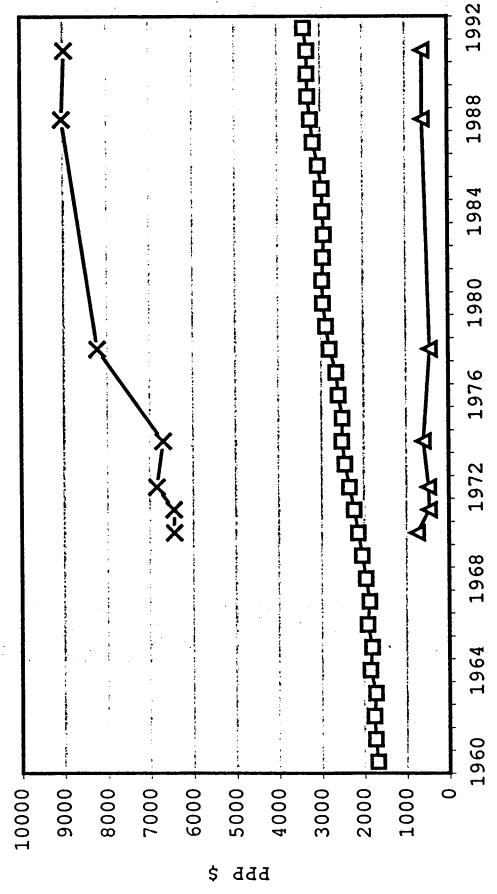
China



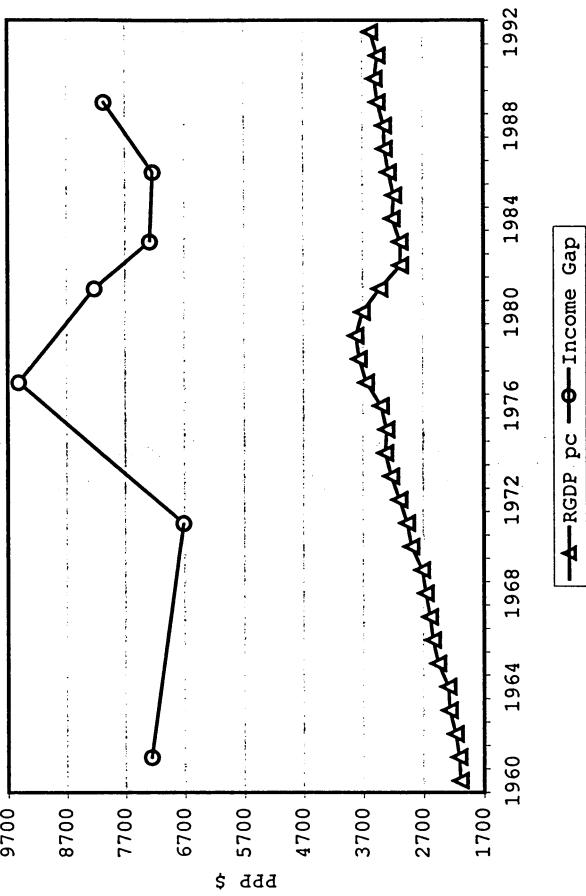
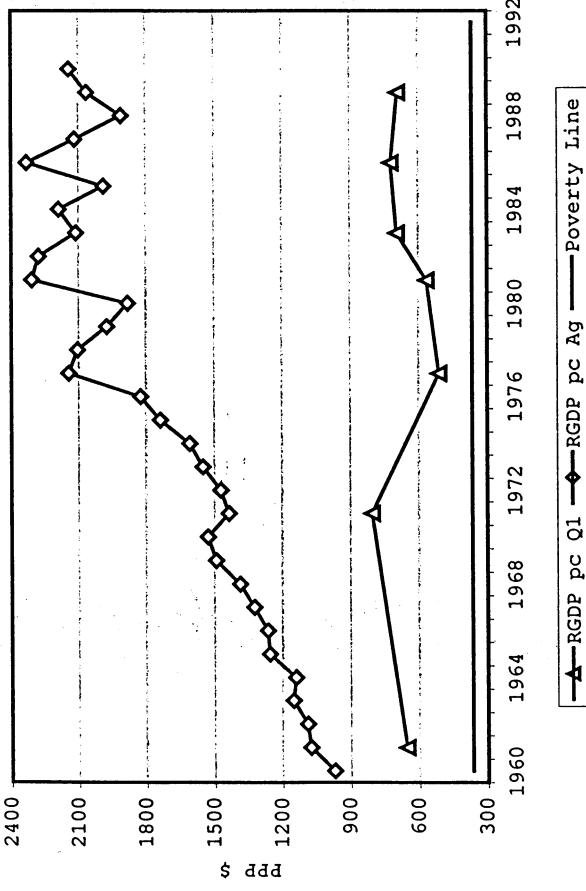
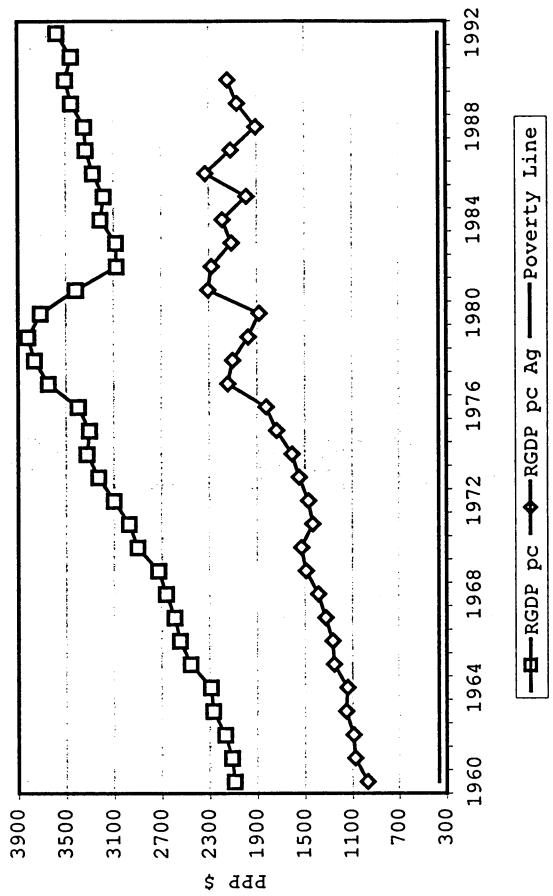
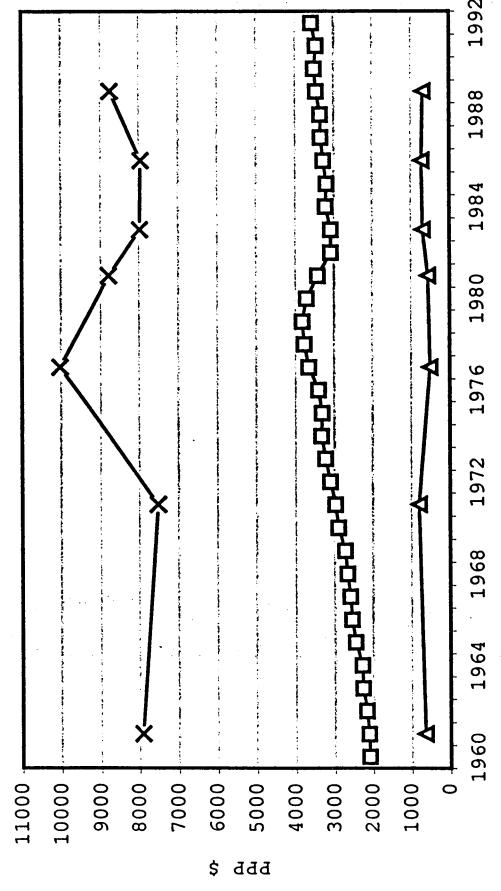
Ivory Coast



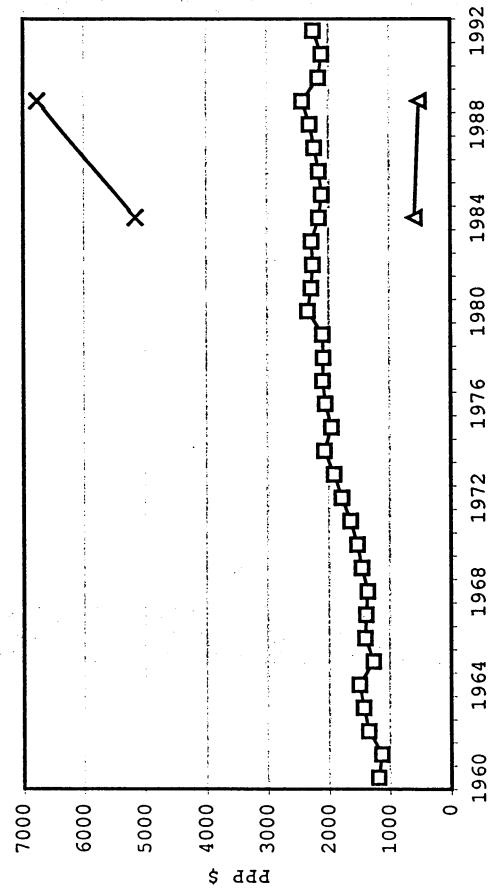
Columbia



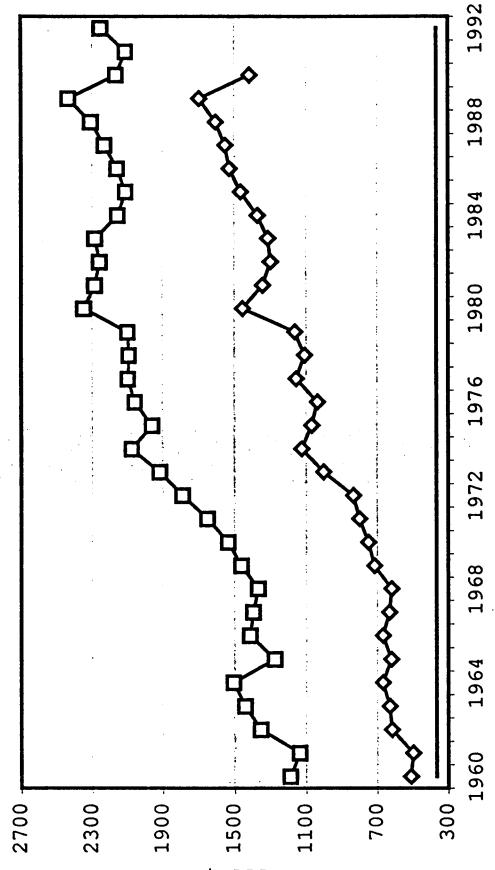
Costa Rica



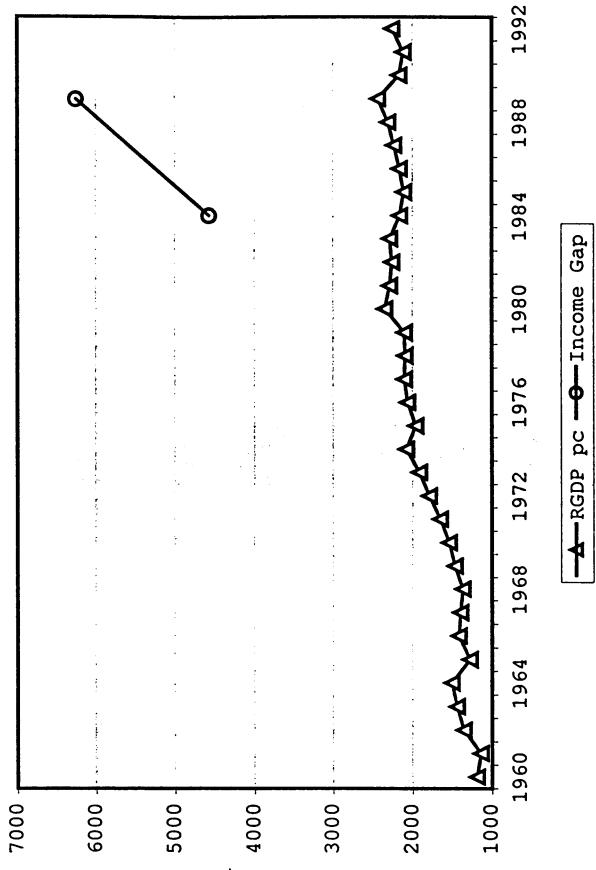
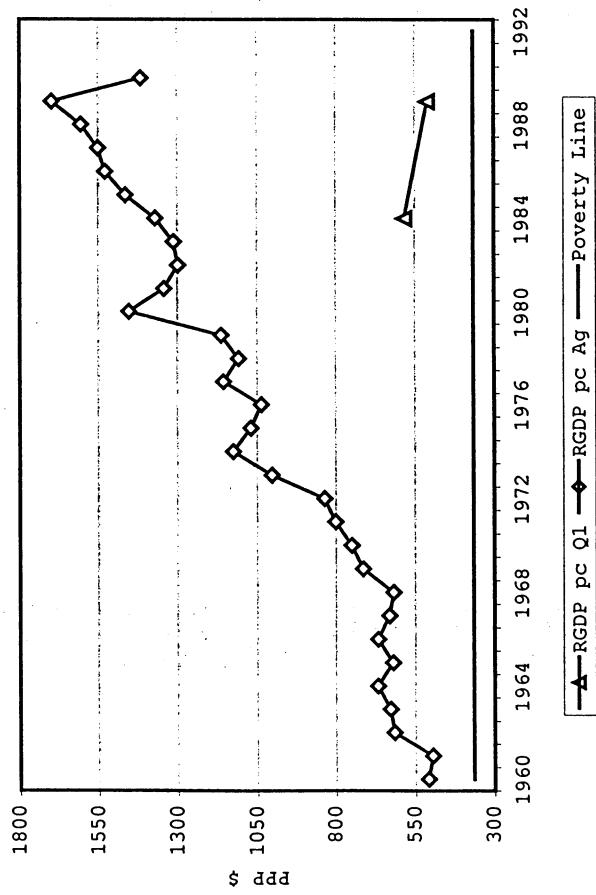
Dominican Republic



—▲— RGDP pc Q1 —◆— RGDP pc Q5



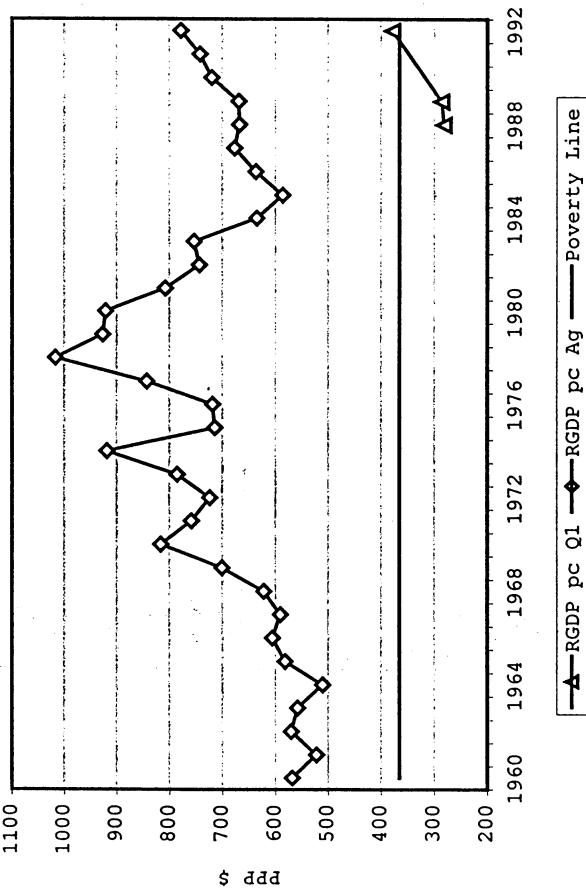
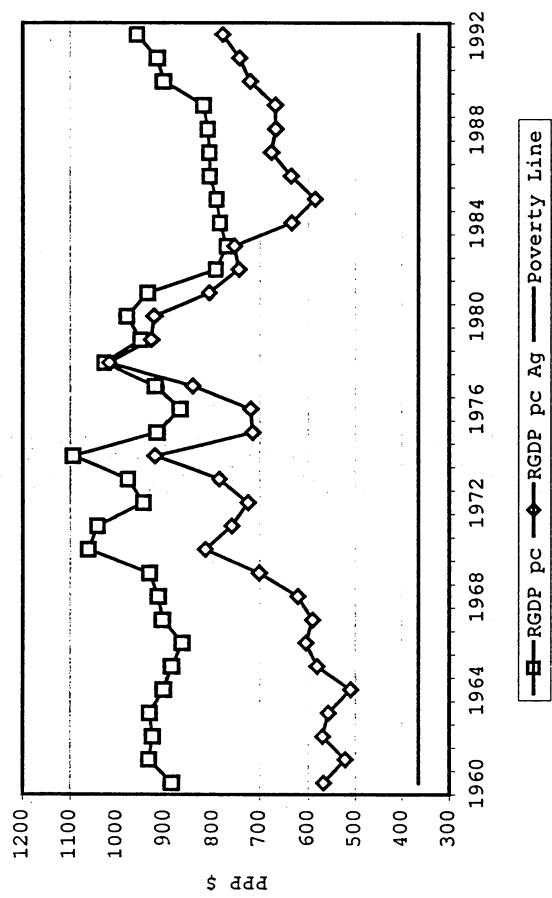
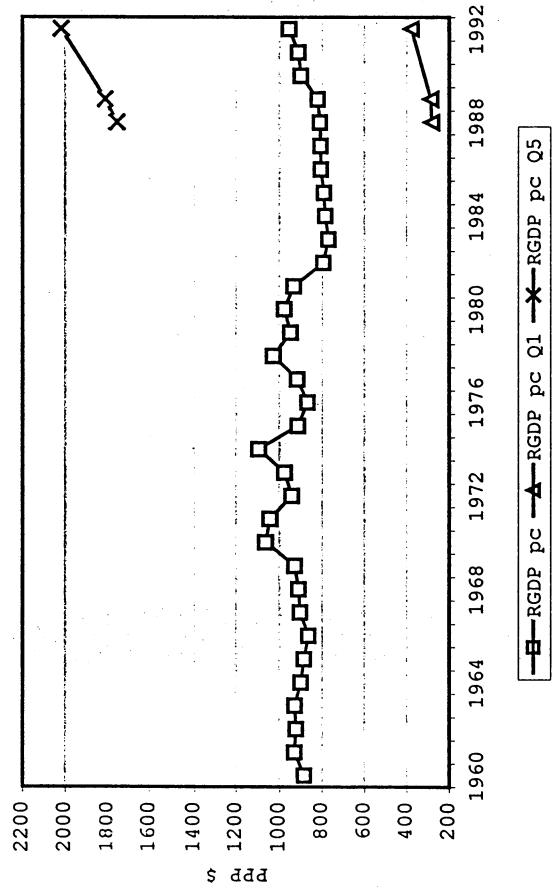
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—▲— RGDP pc Q1 —◆— RGDP pc Ag ——— Poverty Line

—▲— RGDP pc —◆— Income Gap

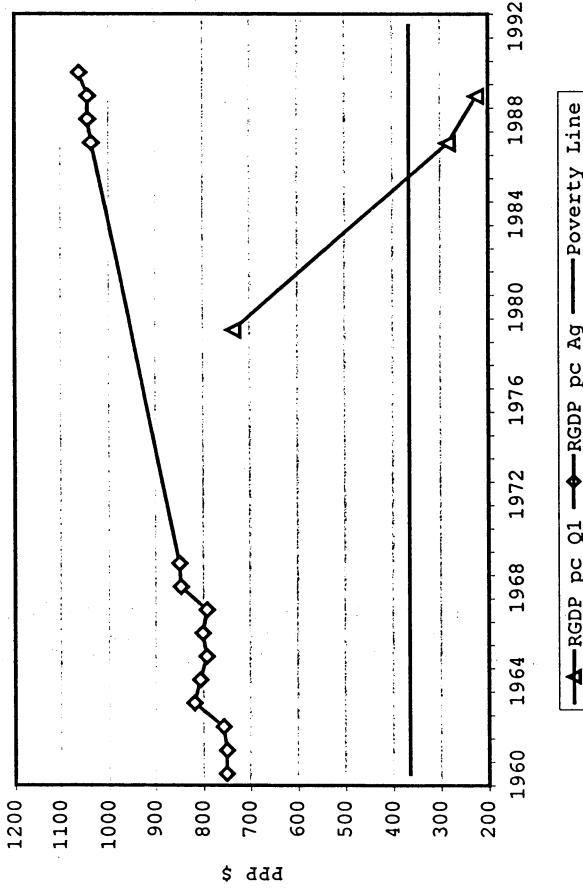
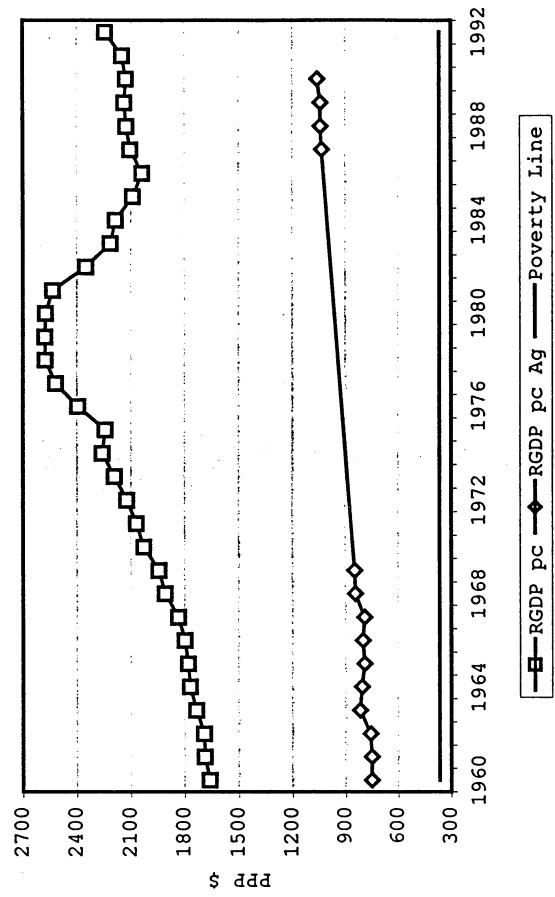
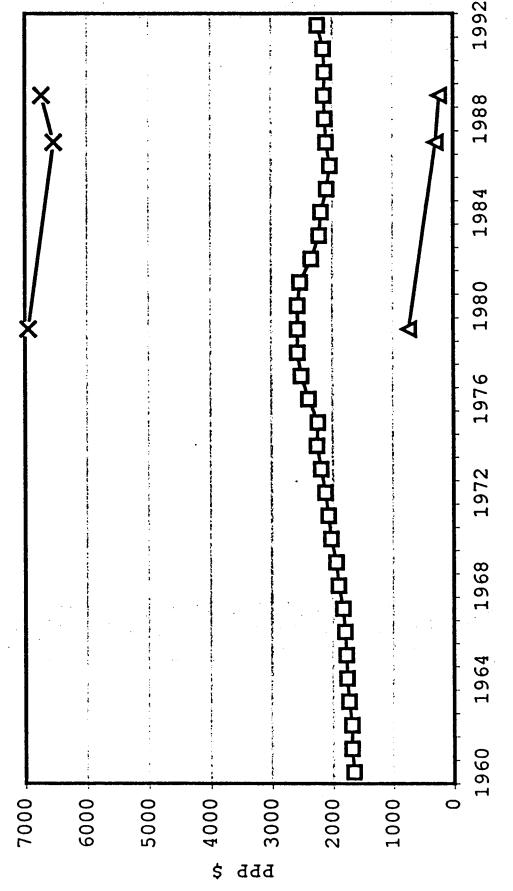
Ghana



—▲— RGDP pc —◆— RGDP pc Ag ——— Poverty Line

—■— RGDP pc —◆— RGDP pc Ag ——— Poverty Line

Guatemala

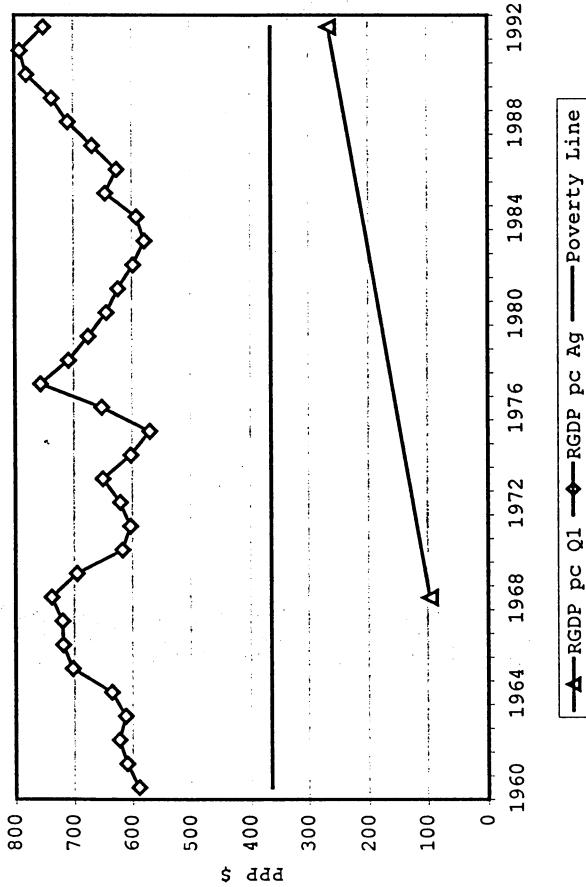
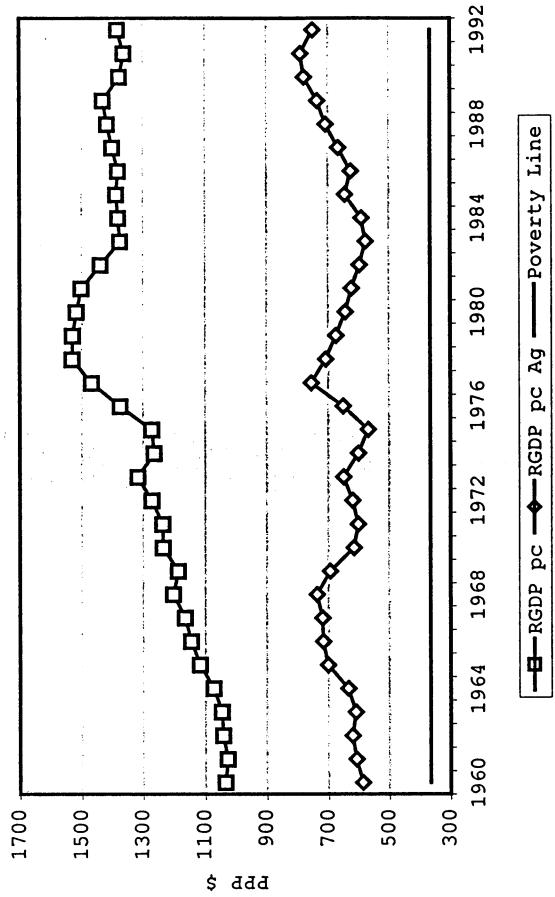
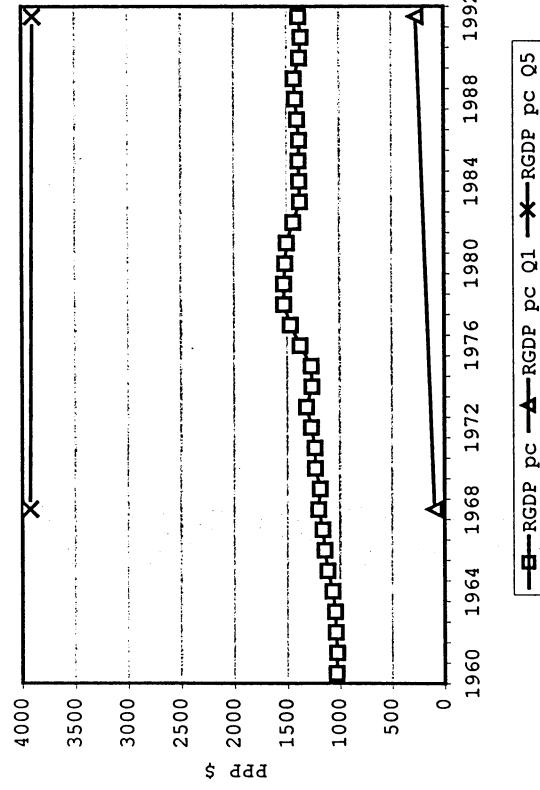


—▲— RGDP pc —◆— RGDP pc Ag

—▲— RGDP pc Q1 —◆— RGDP pc Ag —— Poverty Line

—▲— RGDP pc —◆— RGDP pc Ag

Honduras

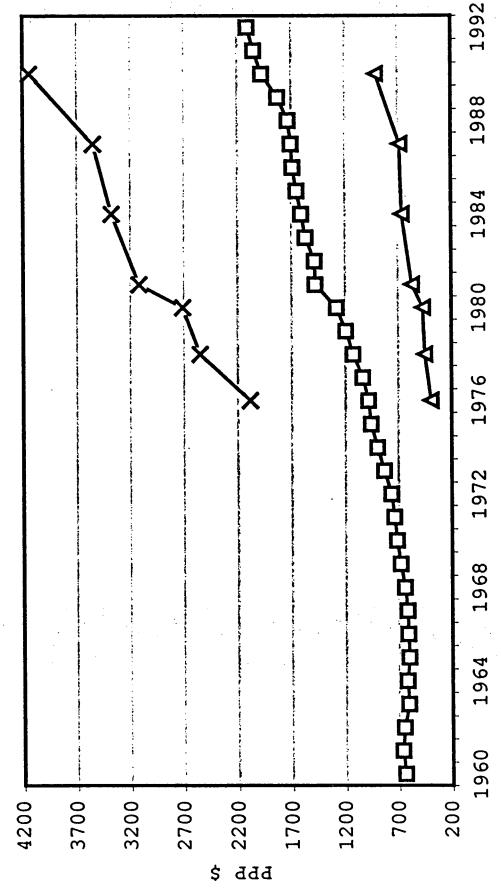


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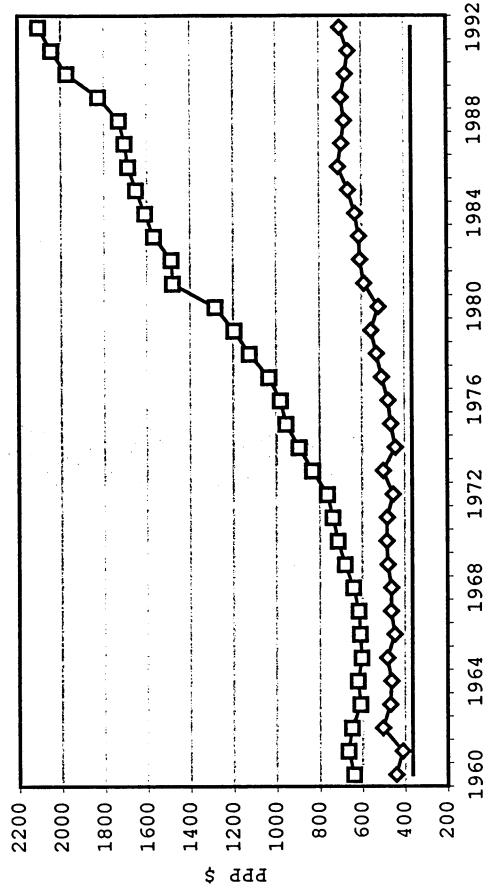
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—▲—RGDP pc —●—Income Gap

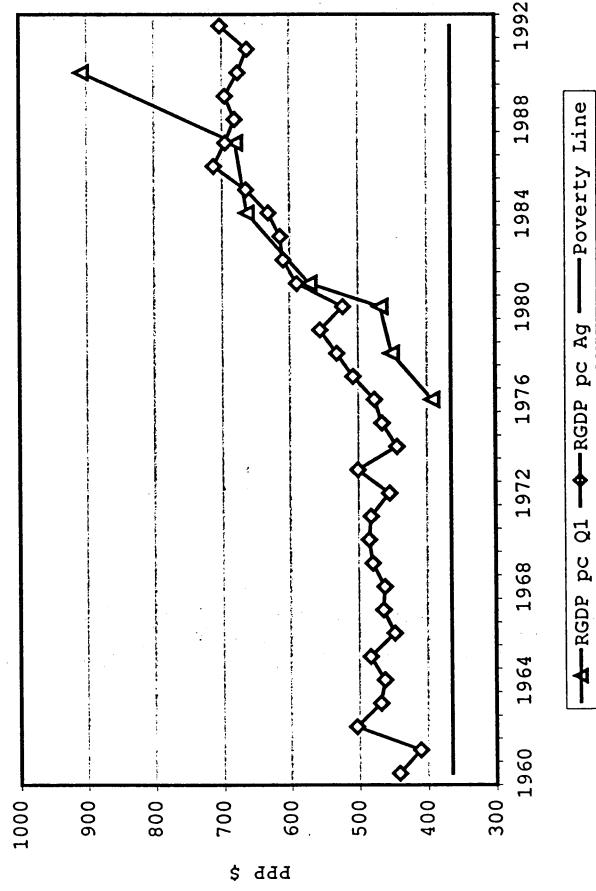
Indonesia



—x— RGDP pc Q1 —□— RGDP pc Q5



—□— RGDP pc Ag —— Poverty Line

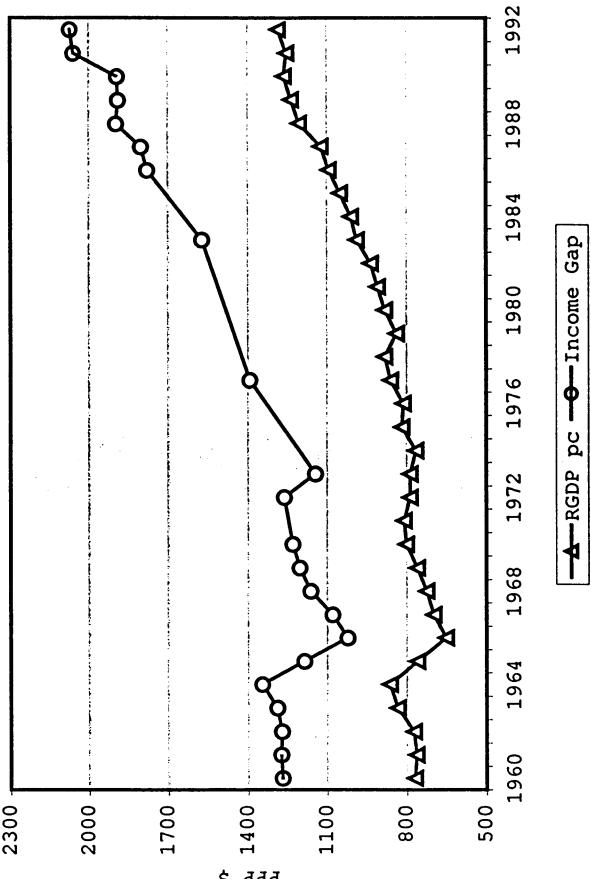
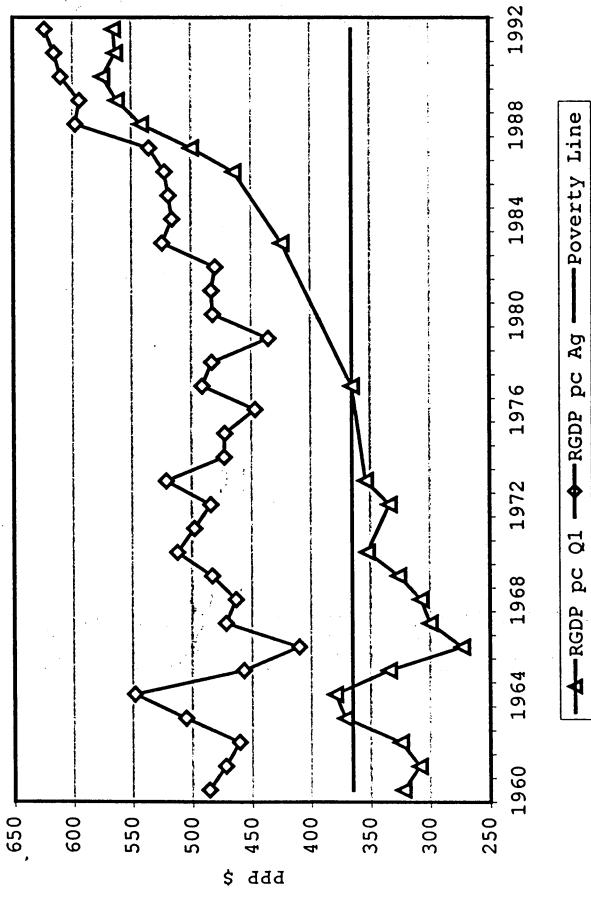
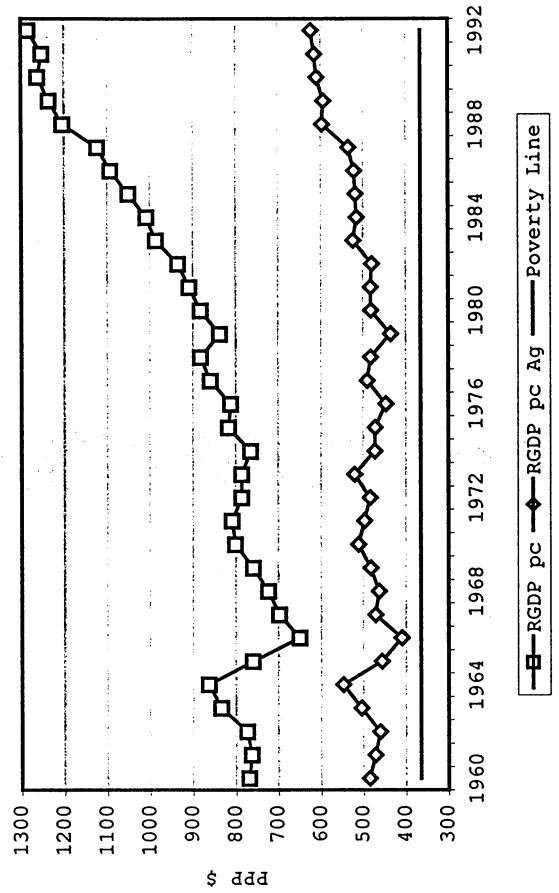
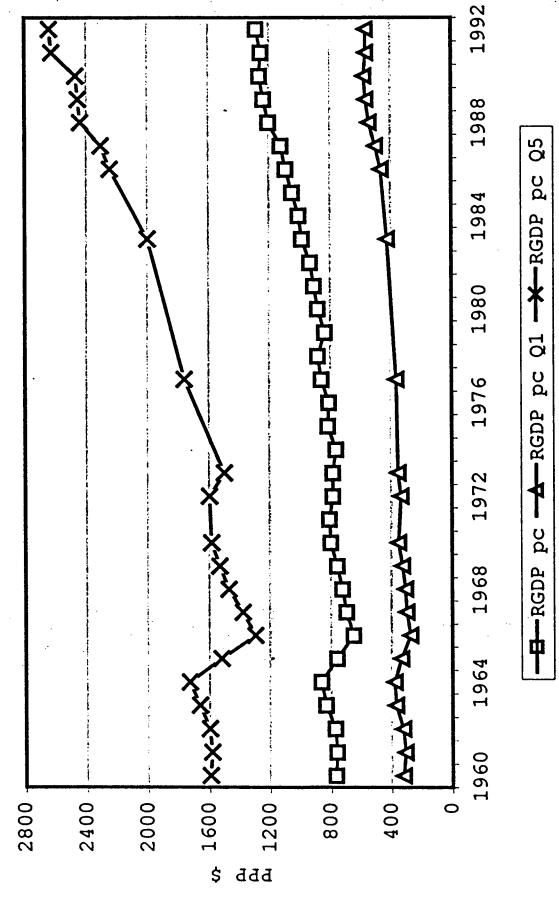


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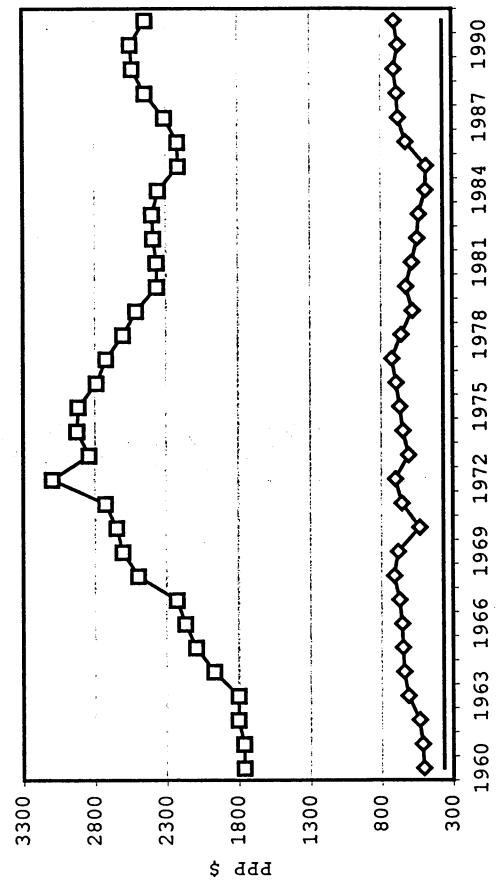


—▲— RGDP pc Ag —●— Income Gap

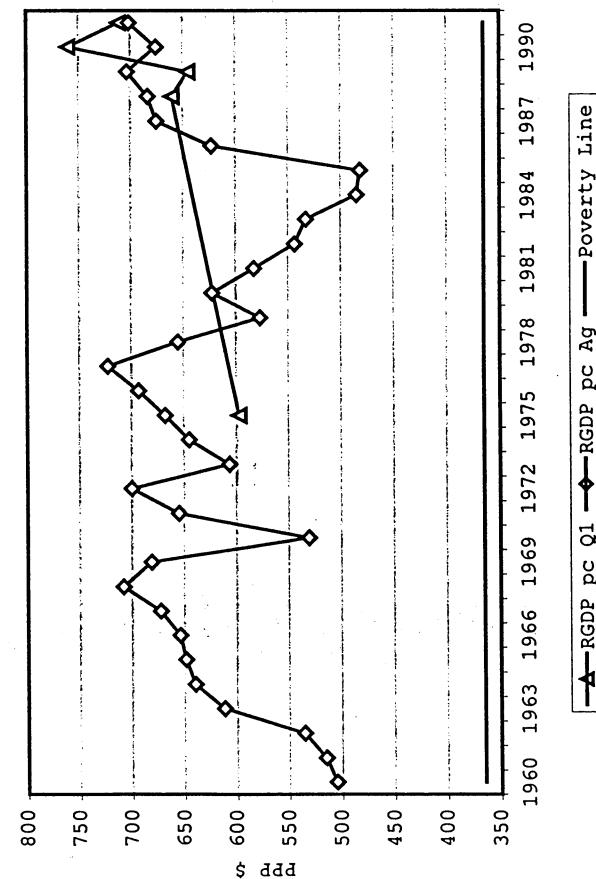
India



Jamaica



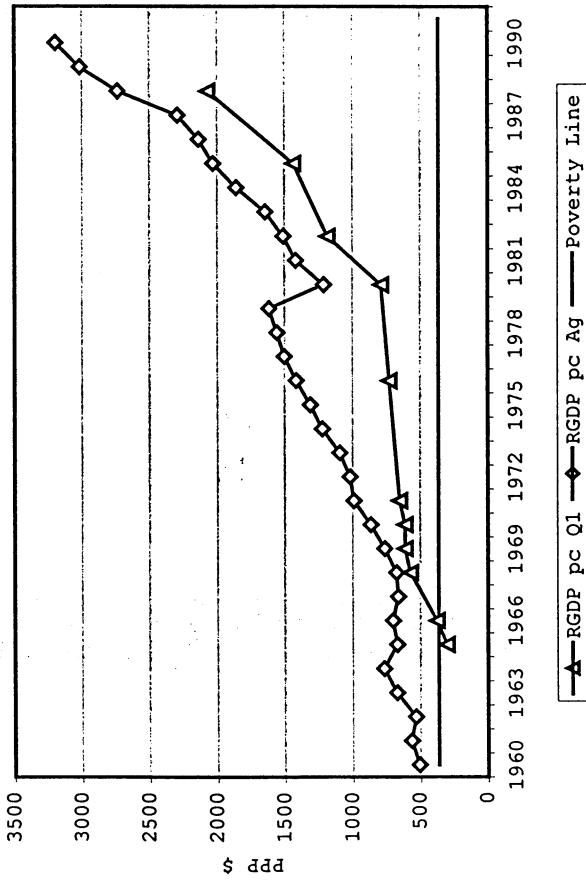
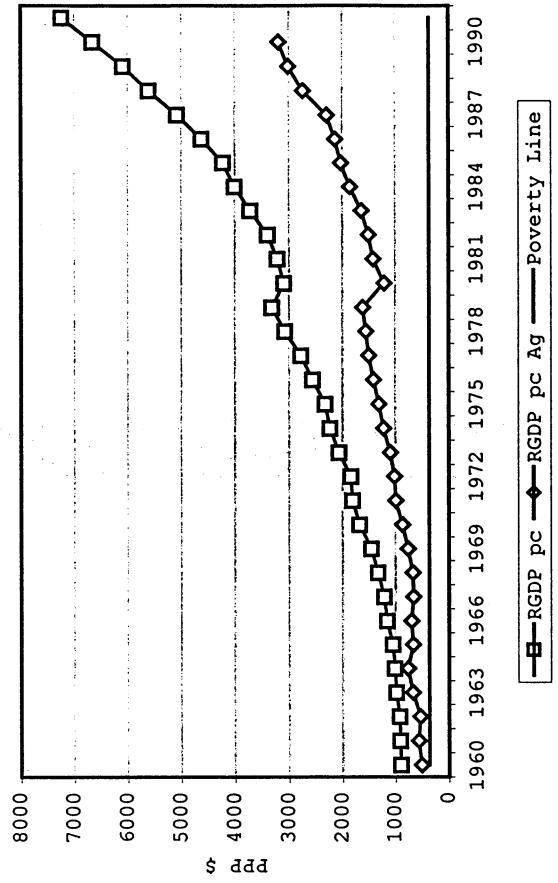
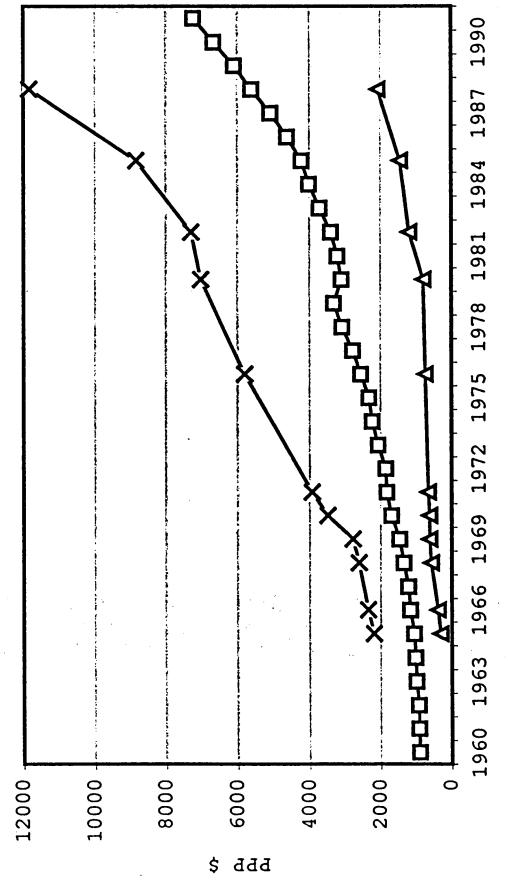
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—▲— RGDP pc Q1 —◆— RGDP pc Ag —— Poverty Line

—▲— RGDP pc —◆— RGDP pc Ag —— Poverty Line

Korea

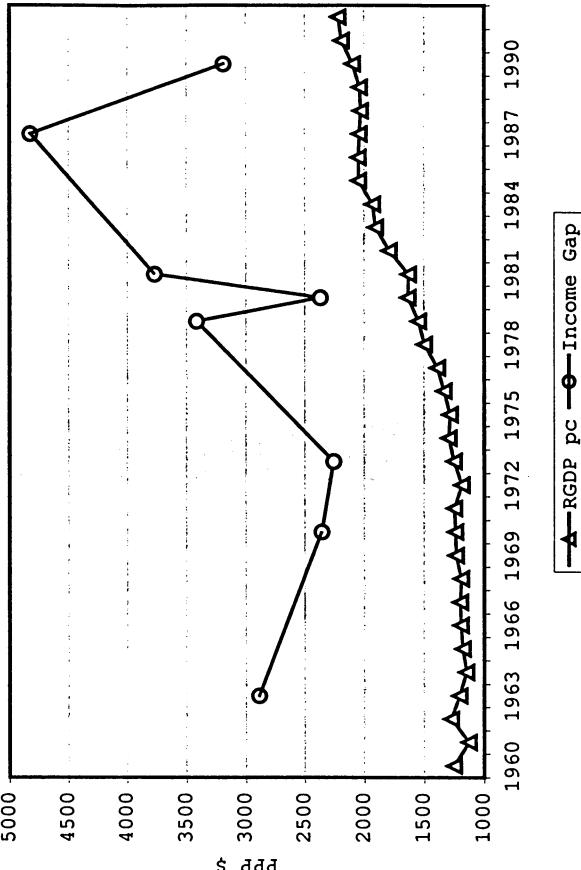
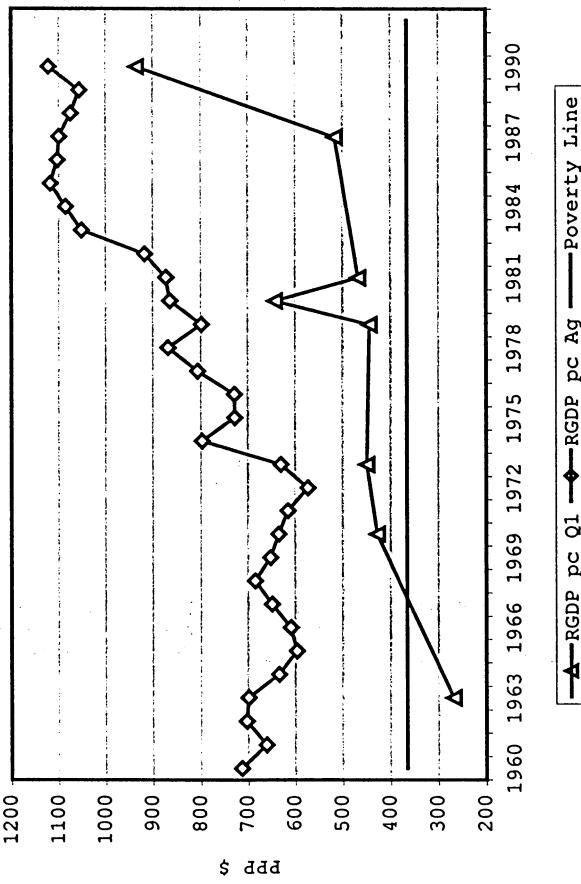
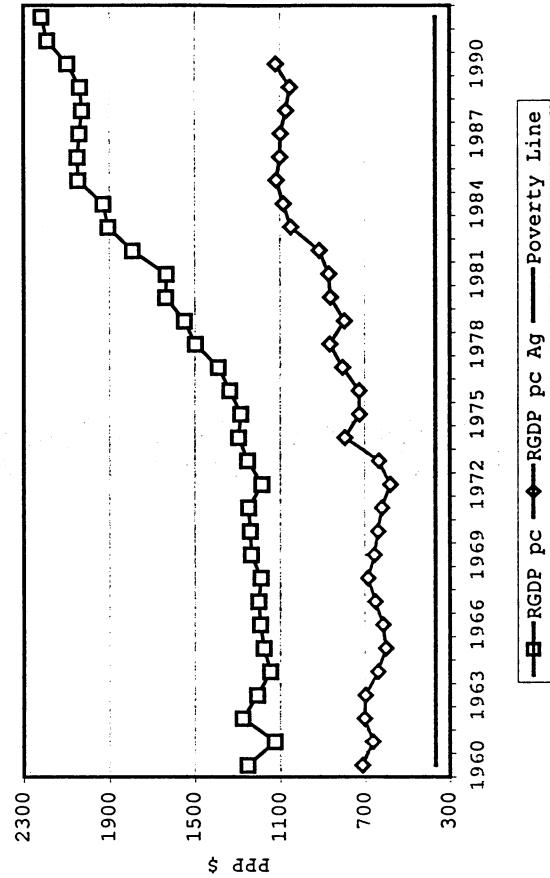
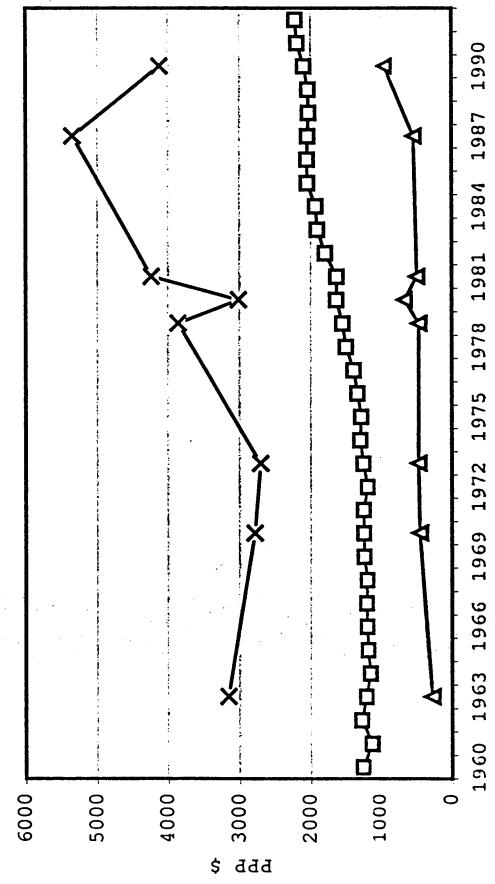


—▲— RGDP pc Q1 —◆— RGDP pc Ag ——— Poverty Line

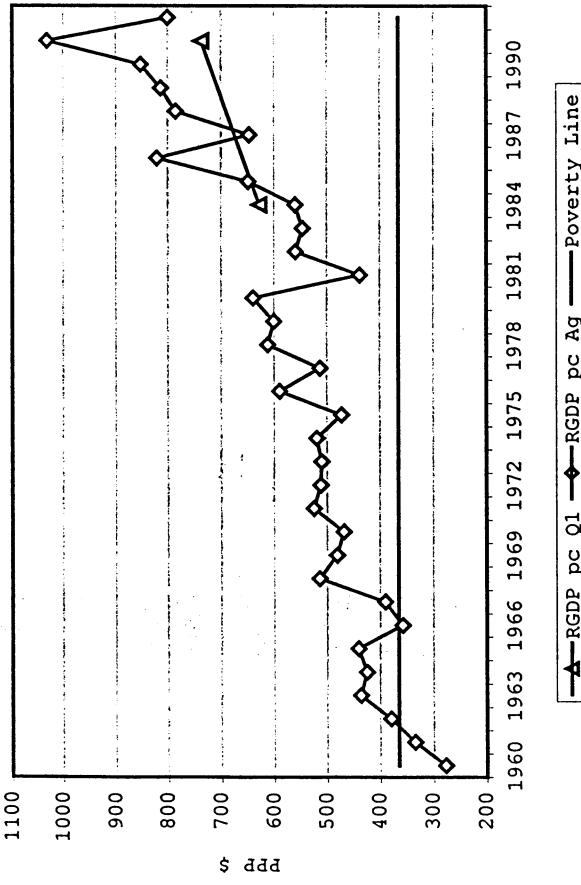
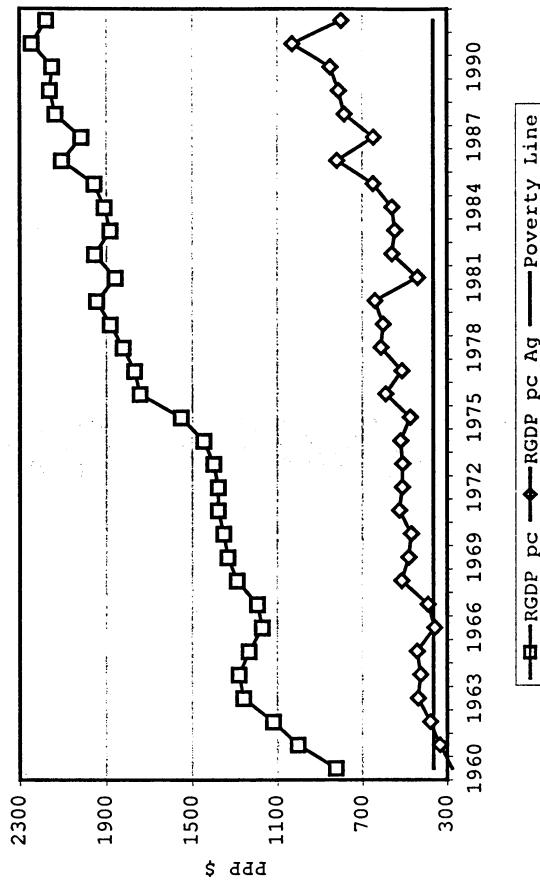
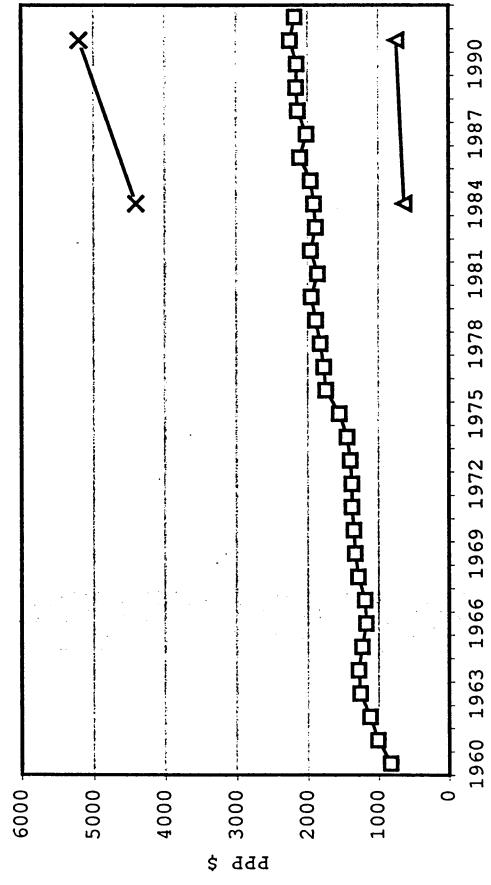
—▲— RGDP pc —◆— RGDP pc Ag ——— Poverty Line

—■— RGDP pc —◆— RGDP pc Ag ——— Poverty Line

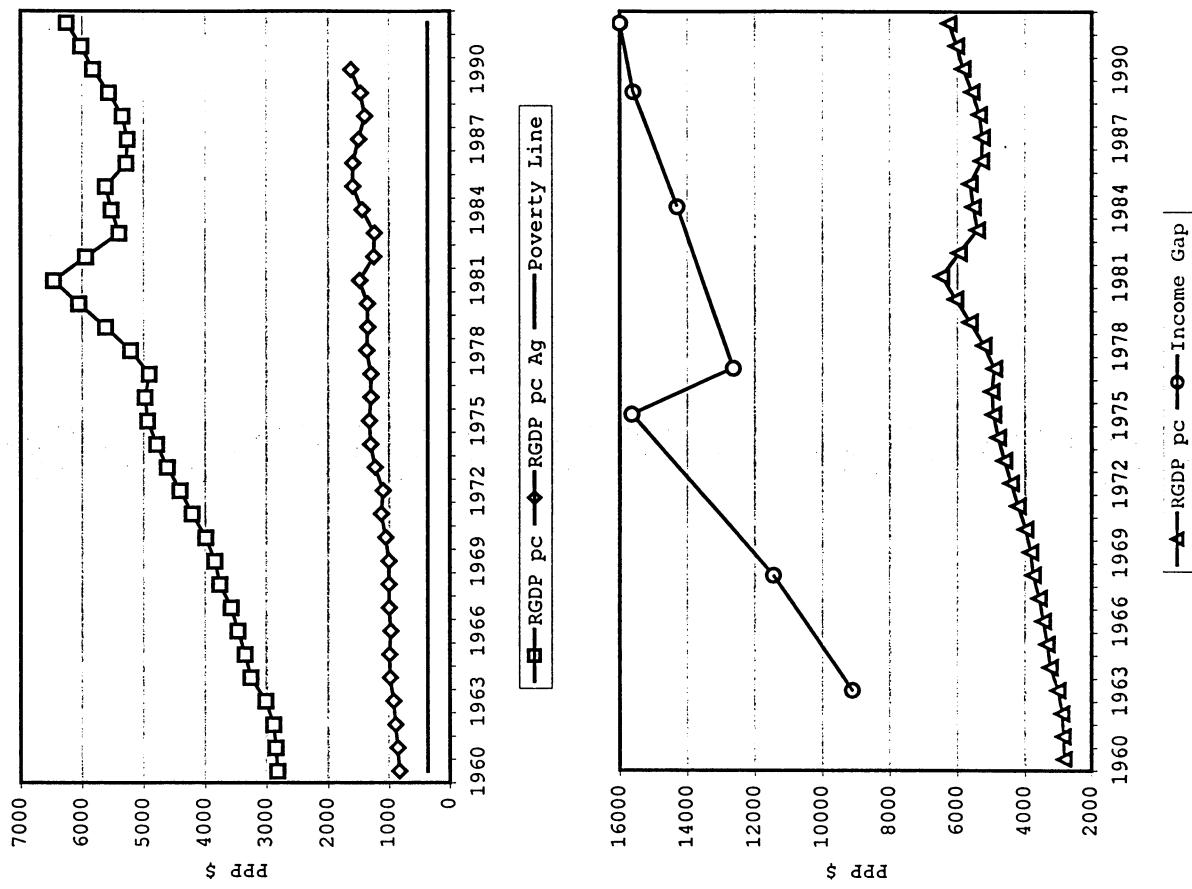
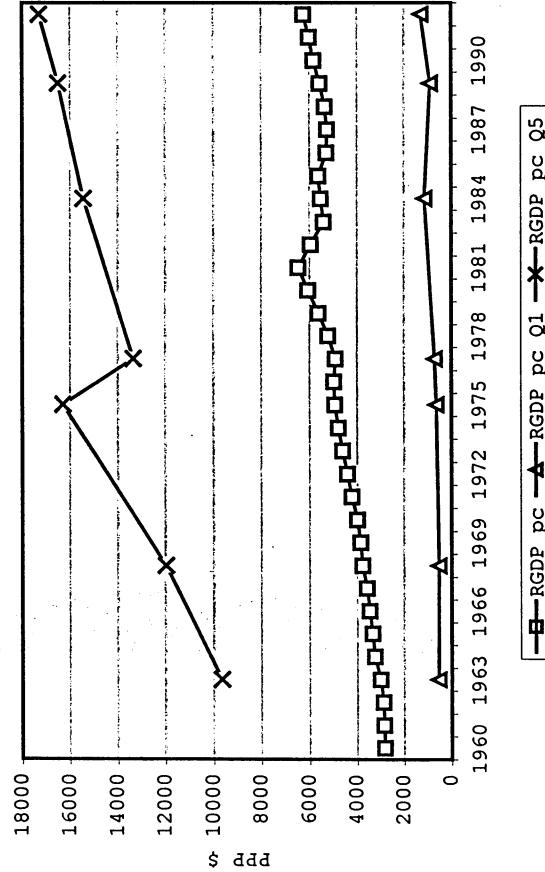
Sri Lank



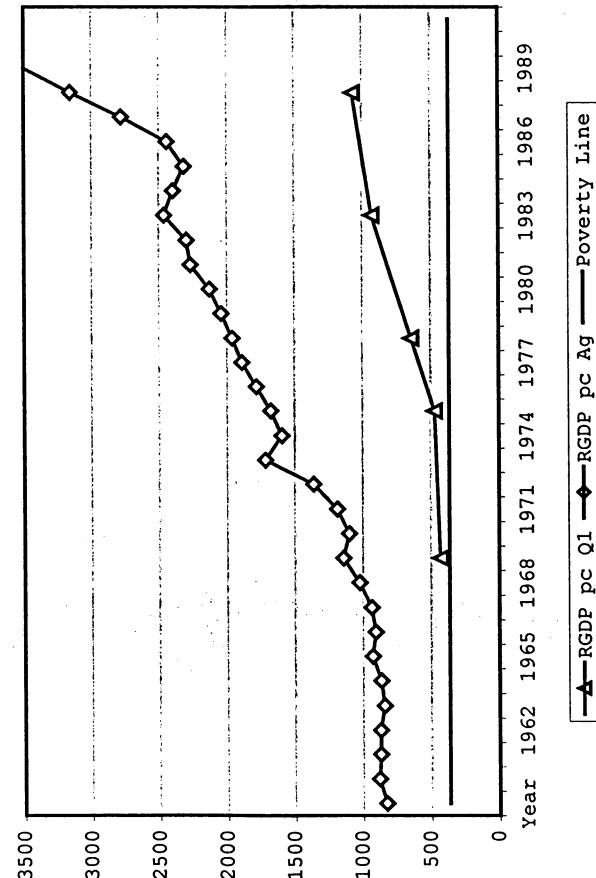
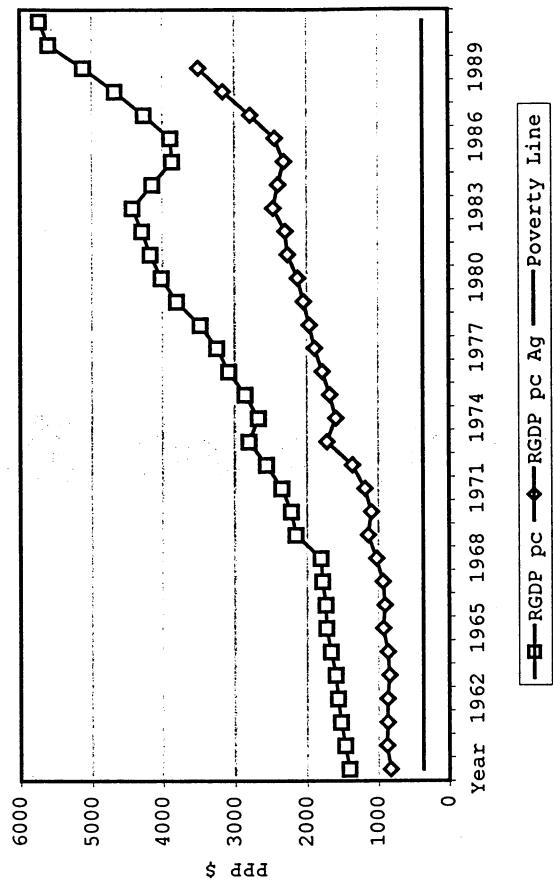
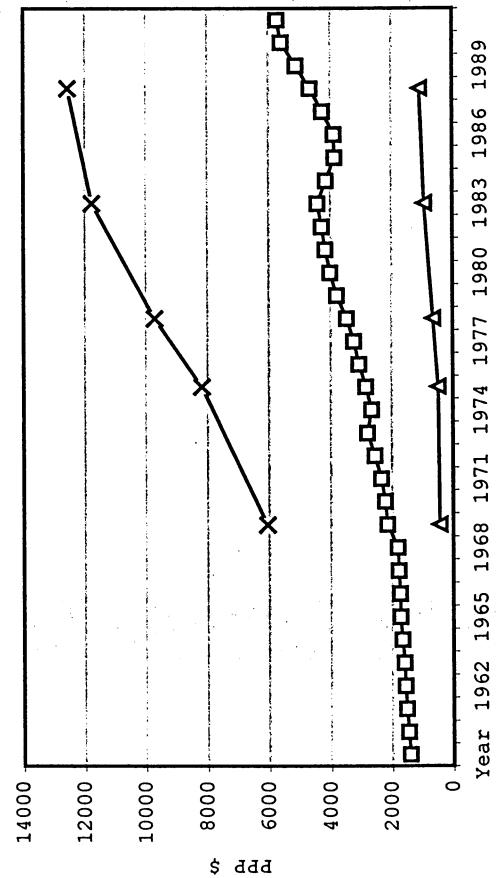
MOROCCO



Mexico



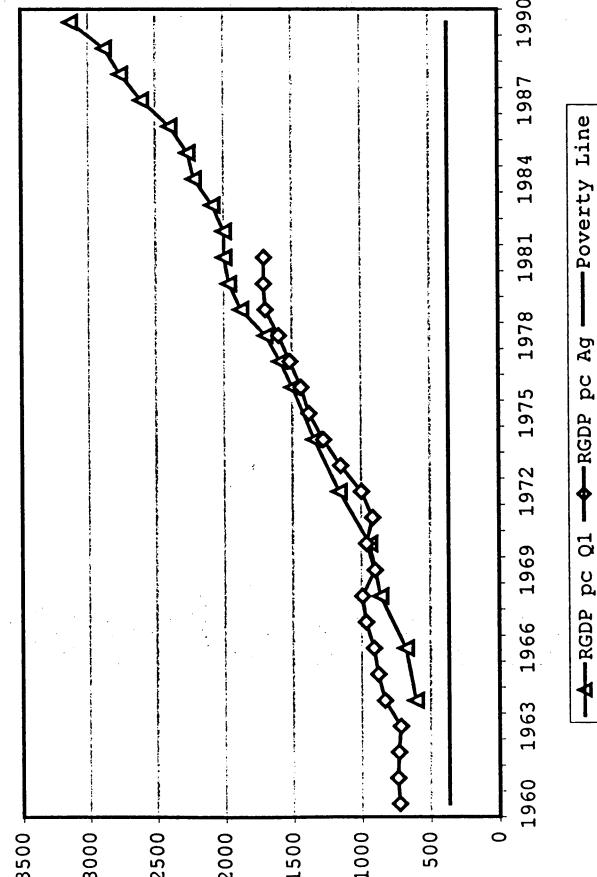
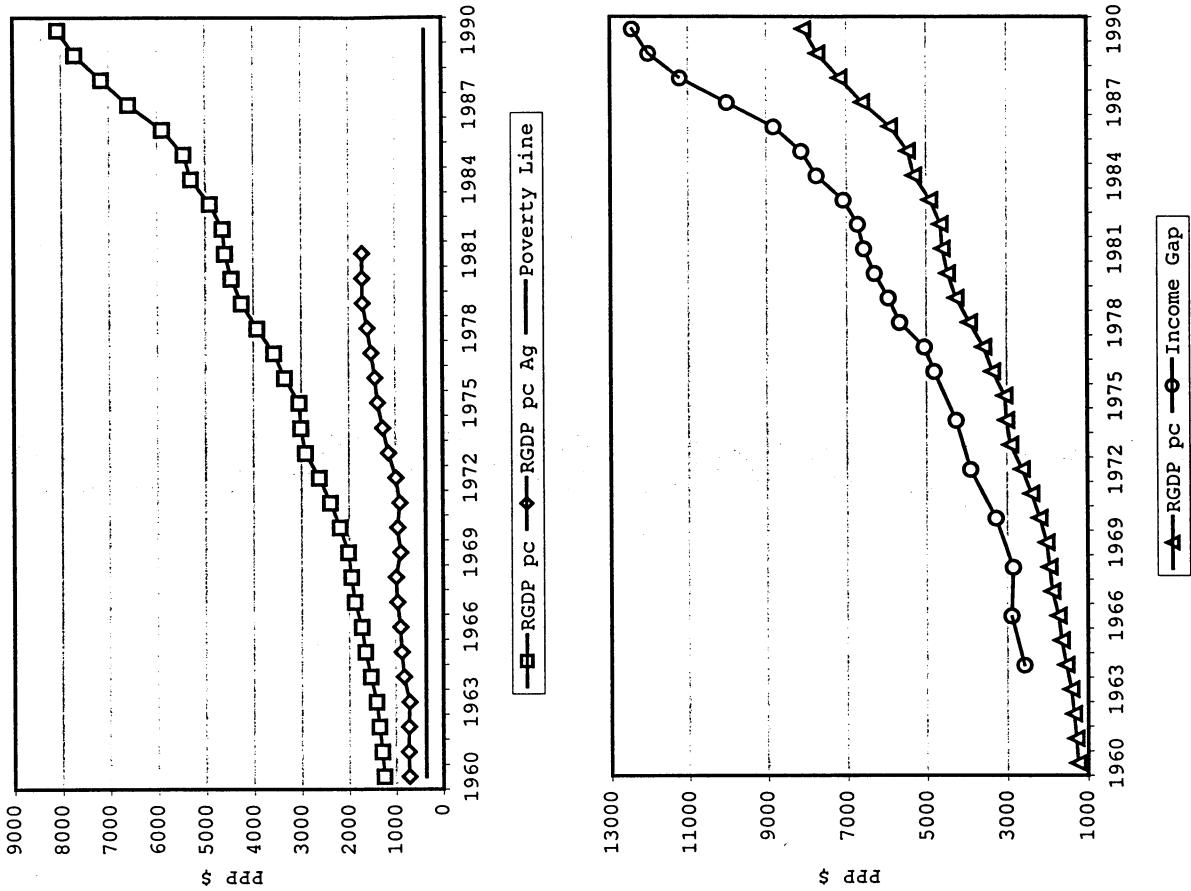
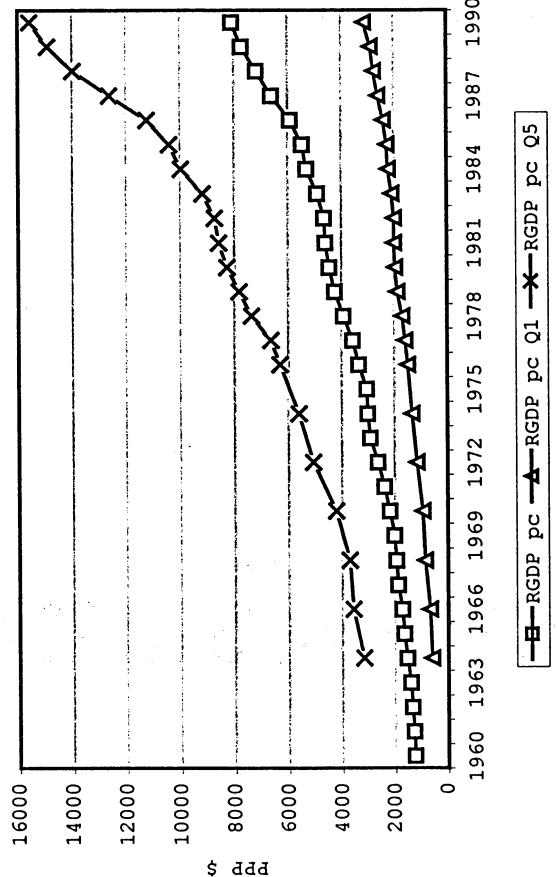
Malaysia



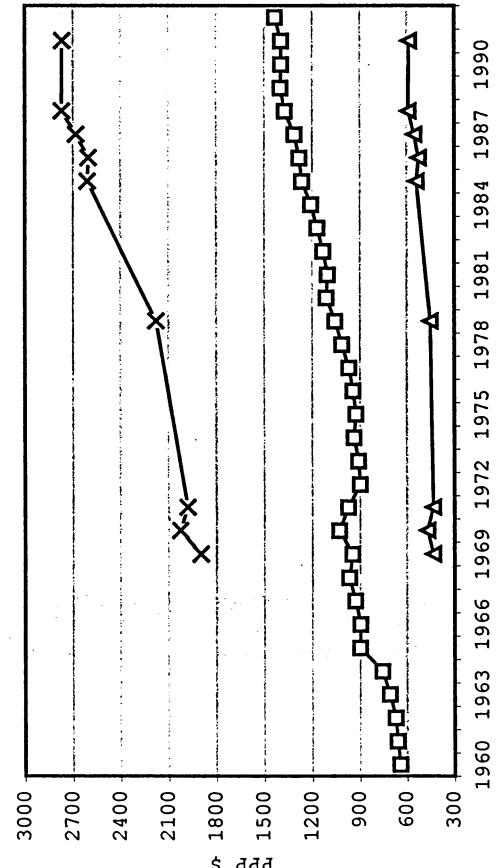
—▲— RGDP pc —◆— RGDP pc Ag —○— Poverty Line

—■— RGDP pc —◆— RGDP pc Ag —— Poverty Line

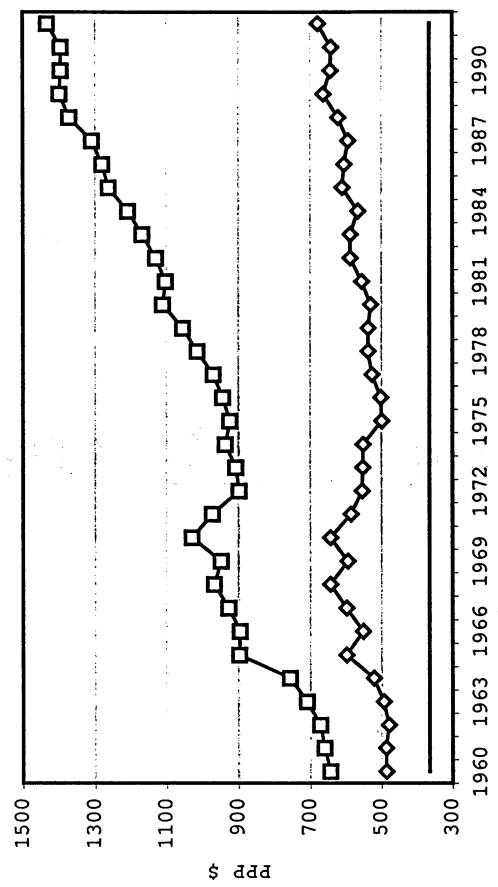
Taiwan



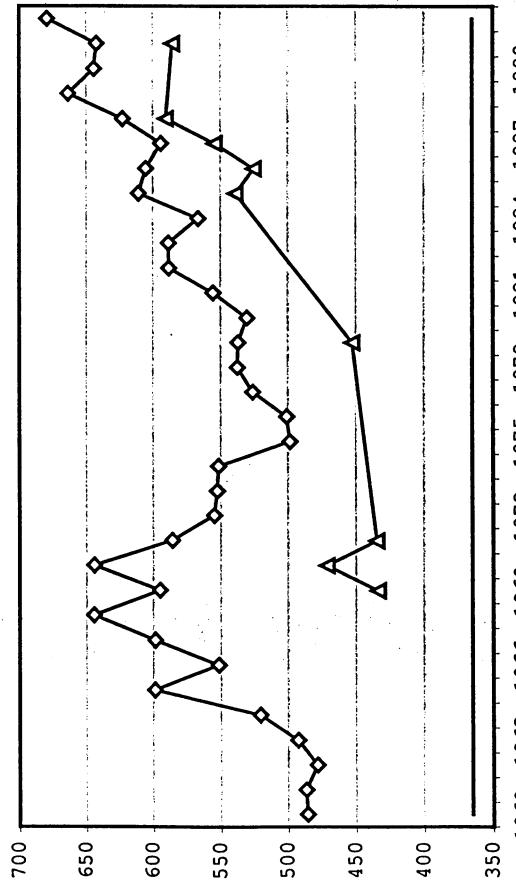
Pakistan



—□— RGDP pc Q1 —▲— RGDP pc Q5



—□— RGDP pc Ag —— Poverty Line

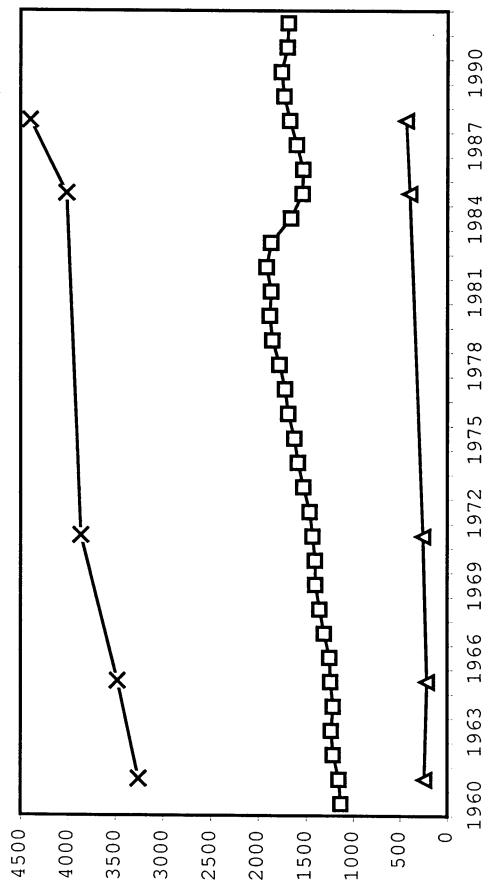


—▲— RGDP pc Ag —— Poverty Line

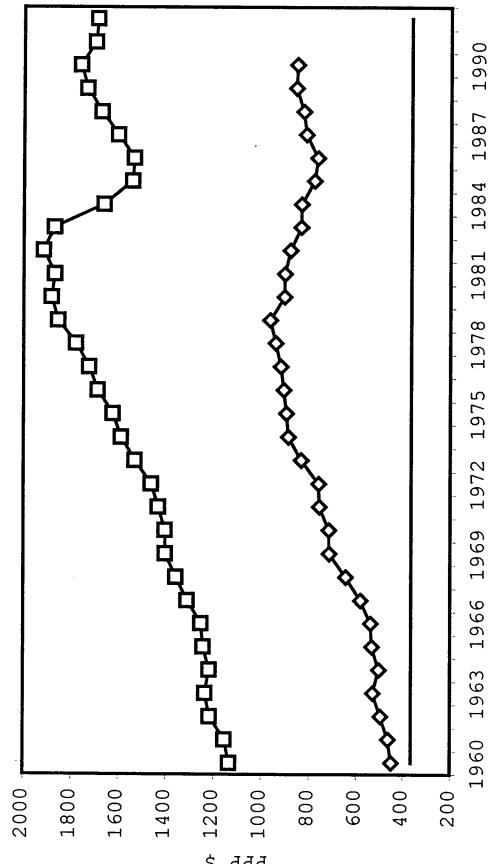


—▲— RGDP pc Ag —○— Income Gap

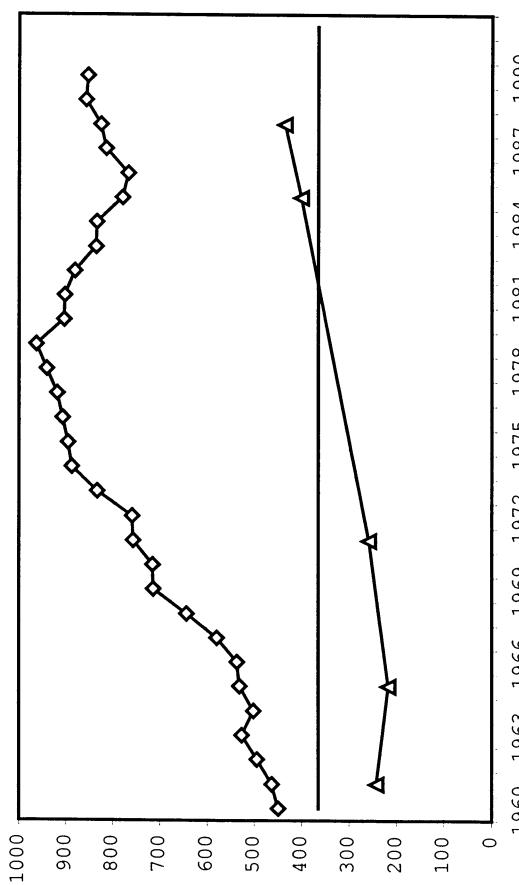
Philippines



—x— RGDP pc Q1 —□— RGDP pc Q5



—□— RGDP pc Ag —◆— Poverty Line

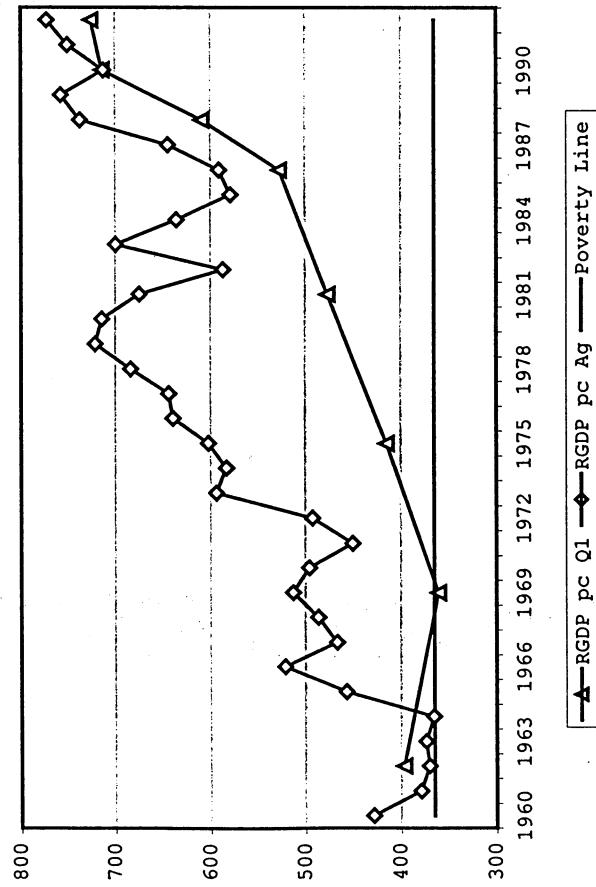
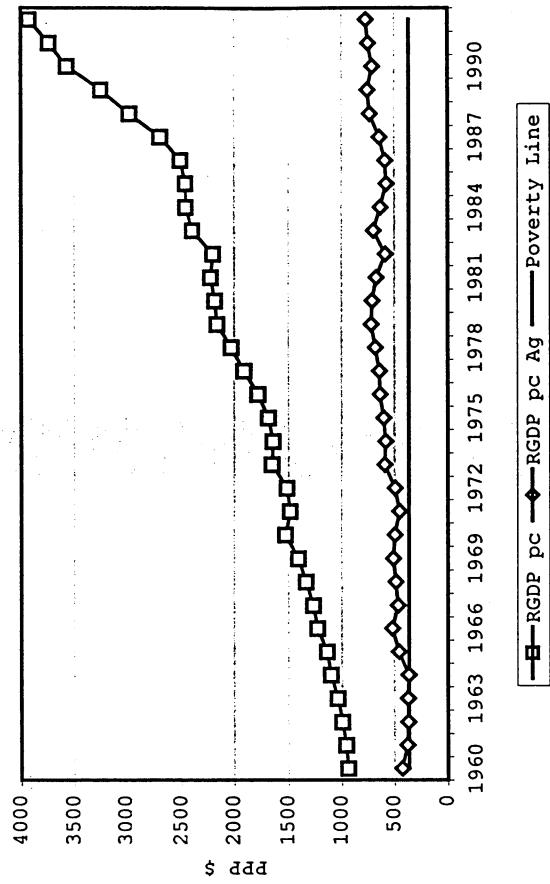
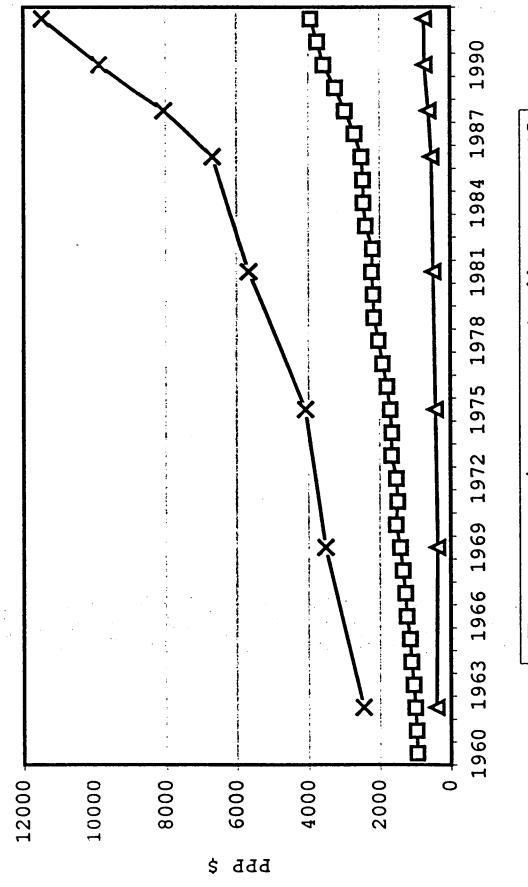


—△— RGDP pc Ag —◆— Poverty Line



—△— RGDP pc —○— Income Gap

Thailand



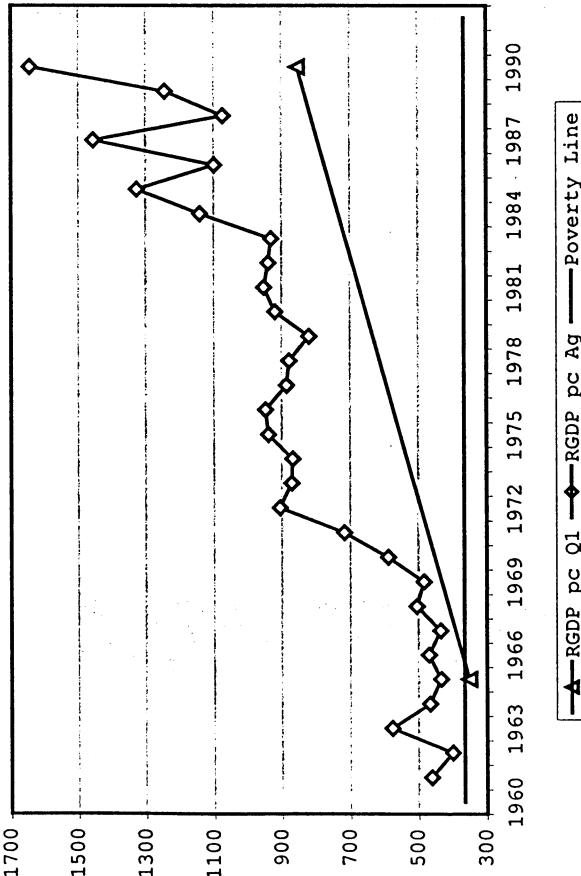
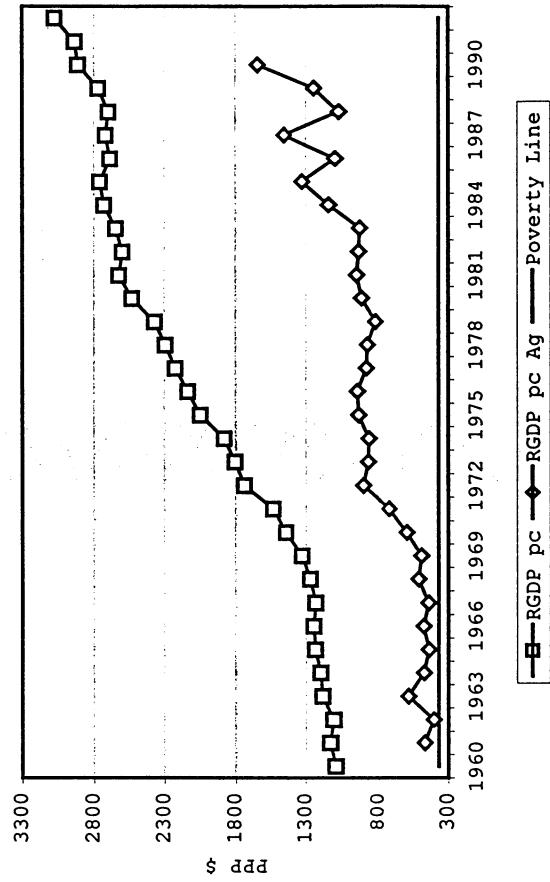
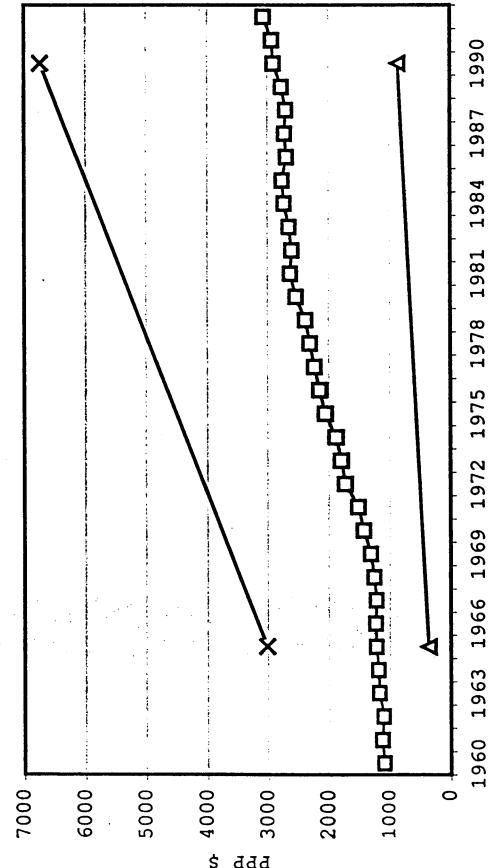
—▲— RGDP pc —◆— RGDP pc Ag

—○— Poverty Line

—▲— RGDP pc —◆— RGDP pc Ag

—○— Poverty Line

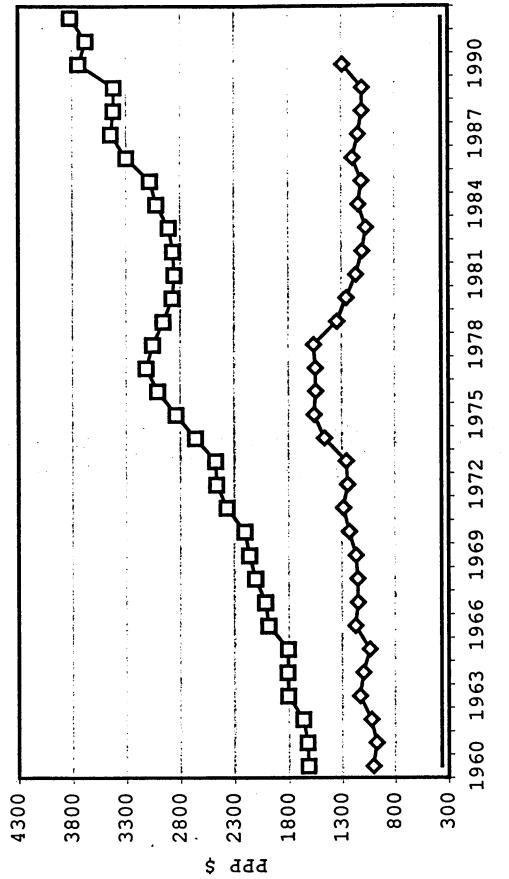
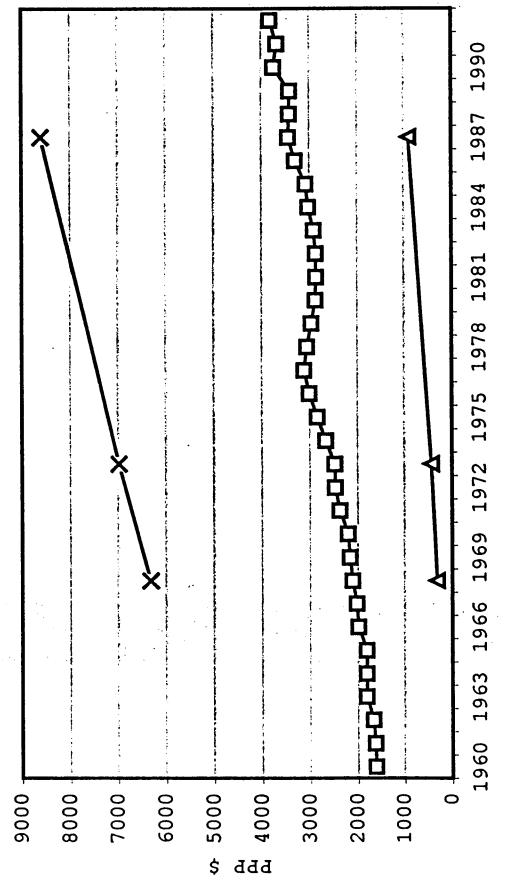
Tunisia



—▲— RGDP pc Q1 —◆— RGDP pc Ag ——— Poverty Line

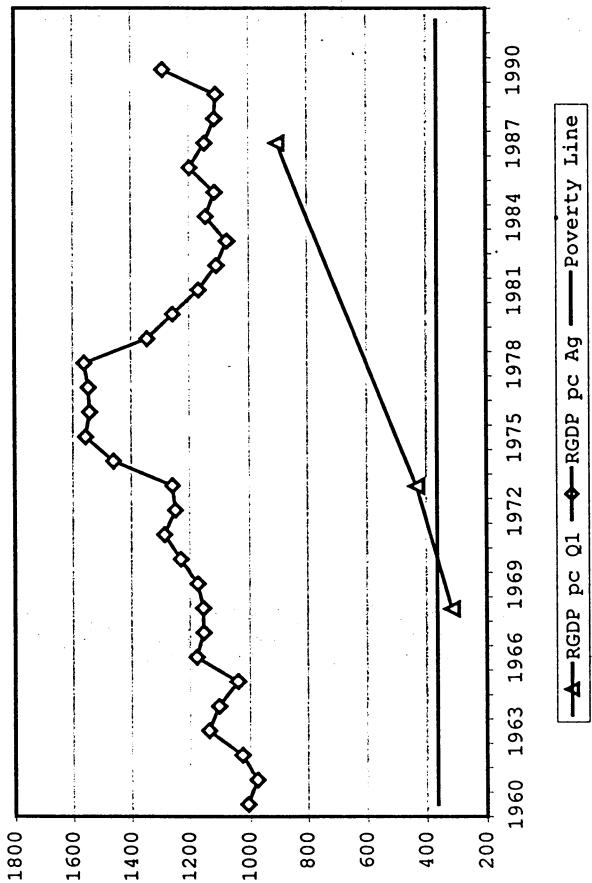
—■— RGDP pc —◆— RGDP pc Ag ——— Poverty Line

Turkey



—□—RGDP pc Q1 —▲—RGDP pc Q5
—■—RGDP pc Ag —○—Poverty Line

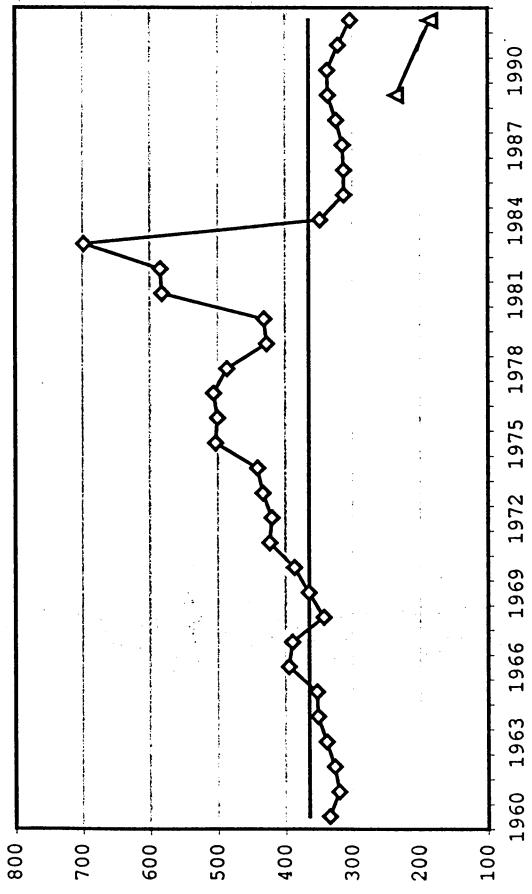
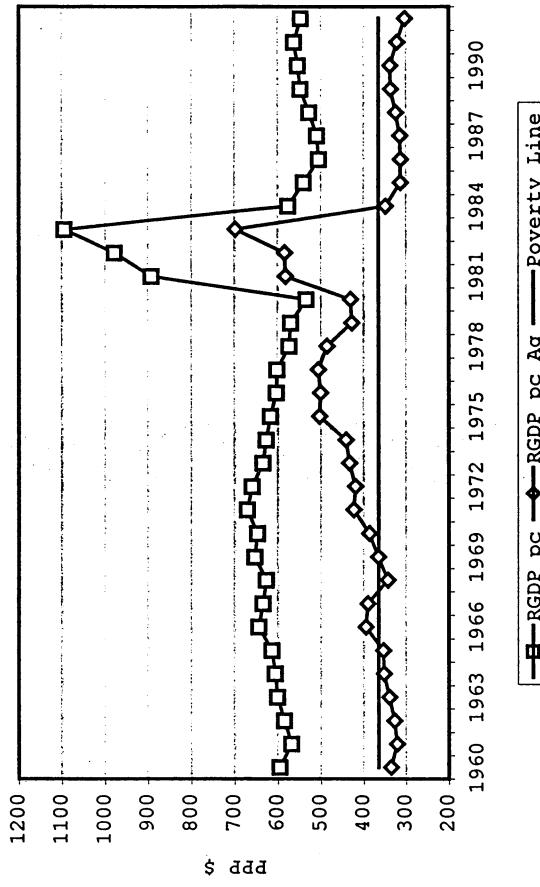
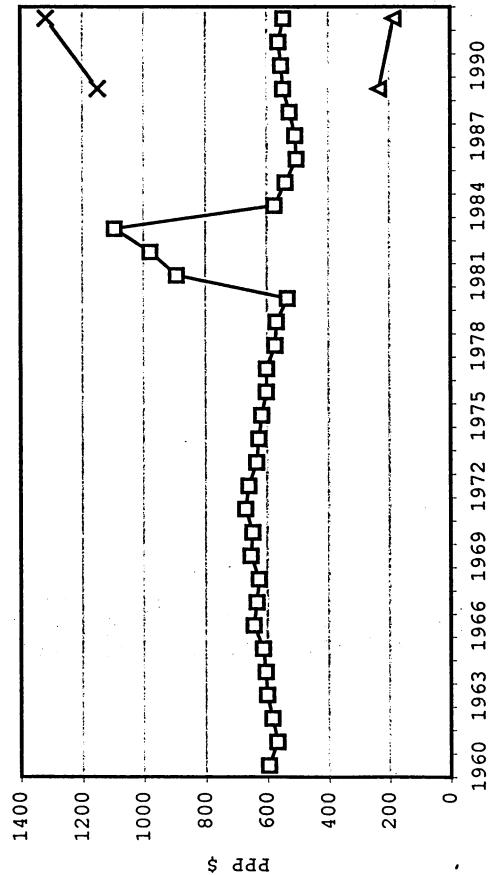
—□—RGDP pc —◆—RGDP pc Ag —○—Poverty Line



—▲—RGDP pc Q1 —◆—RGDP pc Ag
—○—Poverty Line

—▲—RGDP pc —◆—RGDP pc Ag —○—Poverty Line

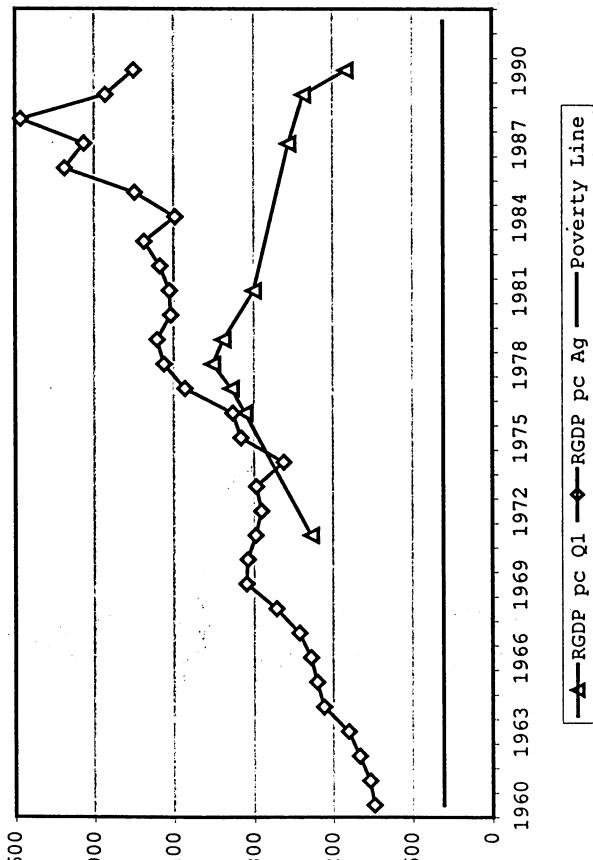
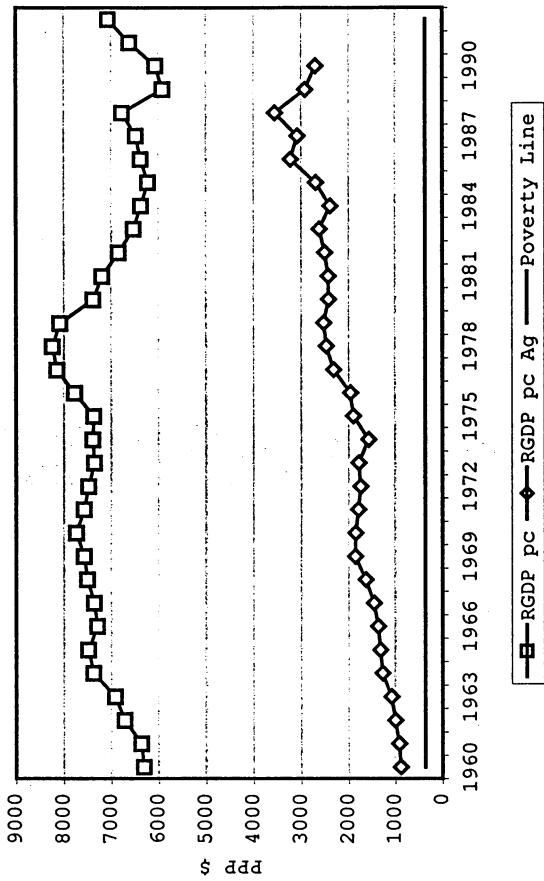
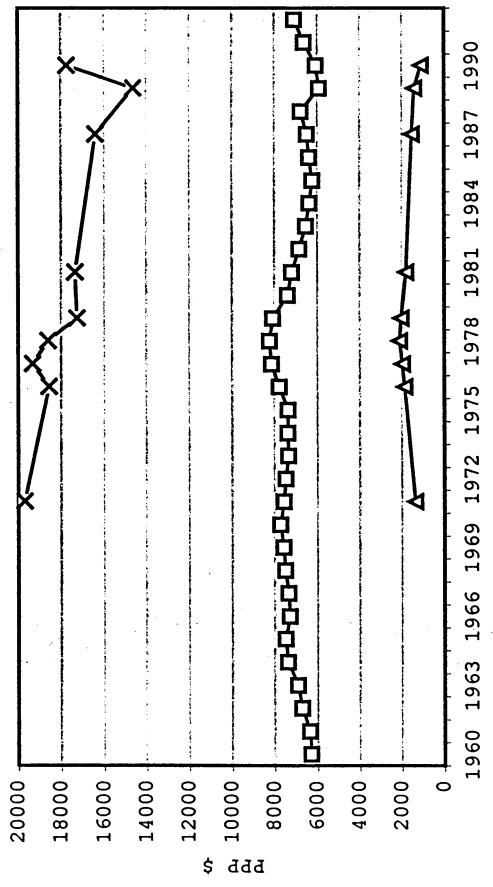
Uganda



—▲— RGDP pc Q1 —◆— RGDP pc Ag —○— Poverty Line

—▲— RGDP pc —◆— Income Gap

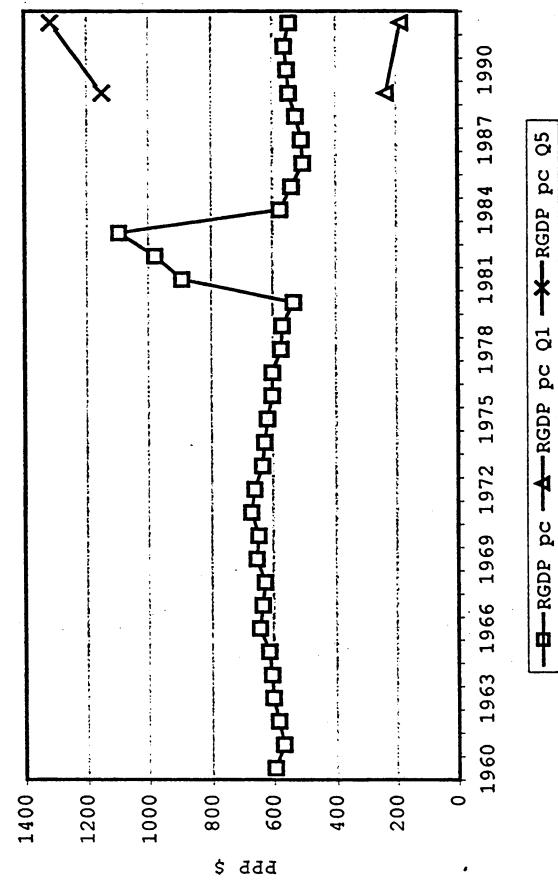
Venezuela



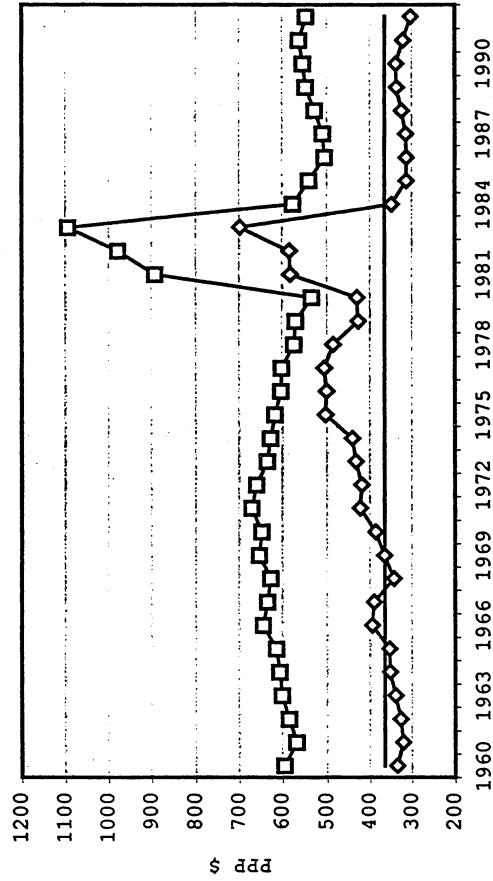
—▲— RGDP pc Q1 —◆— RGDP pc Ag ——— Poverty Line

—■— RGDP pc —◆— RGDP pc Ag ——— Poverty Line

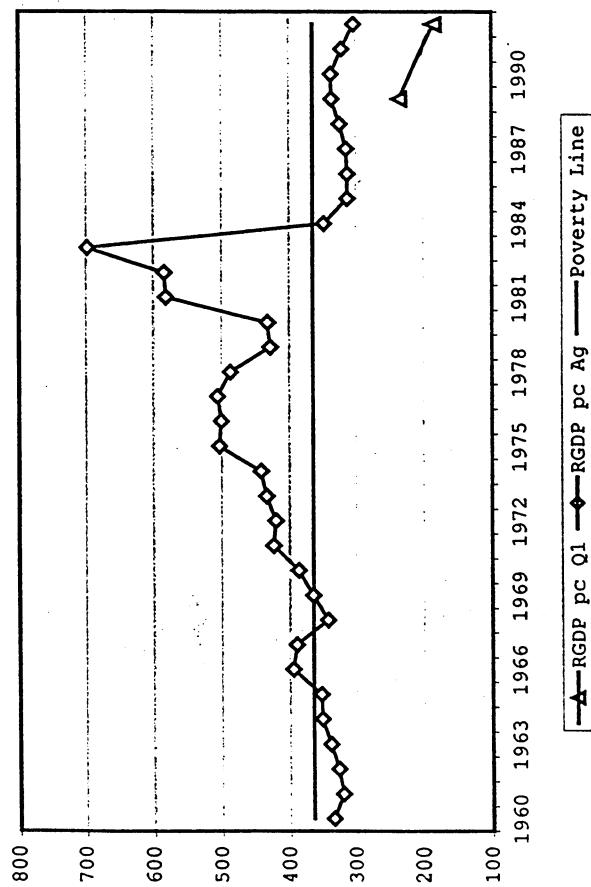
Uganda



—■—RGDP pc Q1 —▲—RGDP pc Ag —— Poverty Line



—■—RGDP pc —◆—RGDP pc Ag —— Poverty Line



—▲—RGDP pc —◆—RGDP pc Ag —— Poverty Line

—▲—RGDP pc —◆—Income Gap

Appendix C

Details of Quintile-Specific Regressions for Table 2

Dummy Variable	Country Code	Country Name
cdum19	BGD	Bangladesh
cdum28	BRA	Brazil
cdum37	CHL	Chile
cdum38	CHN	China
cdum39	CIV	Ivory Coast
cdum42	COL	Columbia
cdum45	CRI	Costa Rica
cdum56	DOM	Dominican Republic
cdum81	GTM	Guatemala
cdum86	HND	Honduras
cdum90	IDN	Indonesia
cdum92	IND	India
cdum99	JAM	Jamaica
cdum108	KOR	South Korea
cdum116	LKA	Sri Lanka
cdum122	MAR	Morocco
cdum127	MEX	Mexico
cdum140	MYS	Malaysia
cdum151	OAN	Taiwan
cdum153	PAK	Pakistan
cdum156	PHL	Philippines
cdum188	THA	Thailand
cdum193	TUN	Tunisia
cdum194	TUR	Turkey
cdum196	UGA	Uganda
cdum202	VEN	Venezuela
Not listed	GHA	Ghana

Regression results for Table 2, Panel A (Unconstrained)

Source SS df MS						Number of obs = 181
<hr/>						F(30, 150) = 60.56
Model 45.0362643 30 1.50120881						Prob > F = 0.0000
Residual 3.71848163 150 .024789878						R-squared = 0.9237
<hr/>						Adj R-squared = 0.9085
Total 48.754746 180 .2708597						Root MSE = .15745
<hr/>						
lrgdpql Coef. Std. Err. t P> t [95% Conf. Interval]	<hr/>					
lrgdpql .7901865 .0695965 11.354 0.000 .6526704 .9277027	<hr/>					
d60 -.1438455 .0667137 -2.156 0.033 -.2756655 -.0120256	<hr/>					
d70 -.1005891 .0523617 -1.921 0.057 -.2040509 .0028727	<hr/>					
d80 -.0052783 .0437925 -0.121 0.904 -.091808 .0812514	<hr/>					
cdum19 .1233619 .1109614 1.112 0.268 -.0958873 .3426112	<hr/>					
cdum28 -.6175898 .1499368 -4.119 0.000 -.9138508 -.3213288	<hr/>					
cdum37 -.0769291 .1961772 -0.392 0.696 -.4645567 .3106985	<hr/>					
cdum38 .10369 .1046584 0.991 0.323 -.1031051 .310485	<hr/>					
cdum39 .0048753 .1280776 0.038 0.970 -.2481938 .2579445	<hr/>					
cdum42 -.2482503 .1430371 -1.736 0.085 -.530878 .0343774	<hr/>					
cdum45 -.2210952 .1495561 -1.478 0.141 -.5166038 .0744134	<hr/>					
cdum56 -.2144657 .1607599 -1.334 0.184 -.5321121 .1031806	<hr/>					
cdum81 -.9237018 .1584901 -5.828 0.000 -.1.236863 -.6105404	<hr/>					
cdum86 -.9212092 .1523583 -6.046 0.000 -.1.222255 -.6201636	<hr/>					
cdum90 .2359812 .1164781 2.026 0.045 .0058315 .4661308	<hr/>					
cdum92 .2705922 .1017844 2.658 0.009 .0694759 .4717085	<hr/>					
cdum99 -.0781711 .139643 -0.560 0.576 -.3540925 .1977502	<hr/>					
cdum108 .2058347 .1341824 1.534 0.127 -.0592971 .4709664	<hr/>					
cdum116 .0398344 .1200159 0.332 0.740 -.1973057 .2769745	<hr/>					
cdum122 .0842058 .1558673 0.540 0.590 -.2237733 .3921849	<hr/>					
cdum127 -.4041796 .1766324 -2.288 0.024 -.7531885 -.0551707	<hr/>					
cdum140 -.2671737 .1587171 -1.683 0.094 -.5807837 .0464364	<hr/>					
cdum151 .5209498 .1487273 3.503 0.001 .2270787 .8148209	<hr/>					
cdum153 .2898413 .1107011 2.618 0.010 .0711064 .5085762	<hr/>					
cdum188 -.2001343 .1321144 -1.515 0.132 -.4611799 .0609113	<hr/>					
cdum193 .0058635 .1623769 0.036 0.971 -.3149779 .326705	<hr/>					
cdum194 -.3333275 .1627519 -2.048 0.042 -.6549099 -.011745	<hr/>					
cdum196 -.0498295 .1475694 -0.338 0.736 -.3414127 .2417538	<hr/>					
cdum202 .0393922 .191116 0.206 0.837 -.3382349 .4170193	<hr/>					
cdum156 -.3513253 .1286995 -2.730 0.007 -.6056235 -.0970272	<hr/>					
_cons .407883 .4846115 0.842 0.401 -.5496634 1.36543	<hr/>					

```

. *Quintile 2;
. reg lrgdpq2 lrgdp1 d60 d70 d80 cdum* if (agdps==. & sample==1);

Source |      SS       df      MS
-----+-----
Model |  52.8087583     30  1.76029194
Residual | 1.53963134    150  .010264209
-----+-----
Total | 54.3483897    180  .301935498

Number of obs =      181
F( 30,    150) =  171.50
Prob > F      = 0.0000
R-squared      = 0.9717
Adj R-squared = 0.9660
Root MSE       = .10131

-----
lrgdpq2 |   Coef.  Std. Err.      t     P>|t| [95% Conf. Interval]
-----+
lrgdp1 |  .9480104  .044783  21.169  0.000  .8595234  1.036497
d60 | -.0566724  .042928 -1.320  0.189 -.141494  .0281493
d70 | -.0223252  .033693 -0.663  0.509 -.0888993  .0442489
d80 | .0241151  .0281789  0.856  0.393 -.0315638  .079794
cdum19 | .0464727  .0713999  0.651  0.516 -.0946067  .1875522
cdum28 | -.6066241  .0964793 -6.288  0.000 -.7972579  -.4159902
cdum37 | -.1375517  .1262333 -1.090  0.278 -.3869768  .1118734
cdum38 | .0597709  .0673441  0.888  0.376 -.0732947  .1928365
cdum39 | -.0754893  .0824135 -0.916  0.361 -.2383307  .0873521
cdum42 | -.311082  .0920395 -3.380  0.001 -.4929433  -.1292207
cdum45 | -.1920777  .0962342 -1.996  0.048 -.3822274  -.0019279
cdum56 | -.2581446  .1034435 -2.496  0.014 -.4625392  -.05375
cdum81 | -.6167137  .101983 -6.047  0.000 -.8182224  -.415205
cdum86 | -.5671593  .0980374 -5.785  0.000 -.7608719  -.3734467
cdum90 | .0633129  .0749497  0.845  0.400 -.0847806  .2114063
cdum92 | .1279041  .0654948  1.953  0.053 -.0015074  .2573156
cdum99 | -.1184772  .0898555 -1.319  0.189 -.2960232  .0590688
cdum108 | .1321905  .0863418  1.531  0.128 -.0384127  .3027938
cdum116 | .0133878  .0772262  0.173  0.863 -.1392038  .1659794
cdum122 | -.0297118  .1002953 -0.296  0.767 -.2278858  .1684623
cdum127 | -.4942868  .1136569 -4.349  0.000 -.7188622  -.2697115
cdum140 | -.2695813  .1021291 -2.640  0.009 -.4713786  -.0677839
cdum151 | .2419283  .095701  2.528  0.013 .0528323  .4310244
cdum153 | .1203237  .0712324  1.689  0.093 -.0204248  .2610721
cdum188 | -.1988542  .0850111 -2.339  0.021 -.3668281  -.0308803
cdum193 | -.0466856  .104484 -0.447  0.656 -.2531361  .1597649
cdum194 | -.2665262  .1047253 -2.545  0.012 -.4734536  -.0595989
cdum196 | -.0615081  .0949559 -0.648  0.518 -.249132  .1261158
cdum202 | -.0846483  .1229766 -0.688  0.492 -.3276385  .1583419
cdum156 | -.1758541  .0828138 -2.123  0.035 -.3394863  -.012222
_cons | -.2057217  .311831 -0.660  0.510 -.8218702  .4104269
-----+

```

```
. *Quintile 3;
. reg lrgdpq3 lrgdpl d60 d70 d80 cdum* if (agdps~=1 & sample==1);
```

Source	SS	df	MS		Number of obs	=	181
Model	60.6438454	30	2.02146151		F(30, 150)	=	311.31
Residual	.974014443	150	.00649343		Prob > F	=	0.0000
					R-squared	=	0.9842
					Adj R-squared	=	0.9810
Total	61.6178598	180	.342321443		Root MSE	=	.08058
<hr/>							
lrgdpq3	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]		
lrgdpl	.9753927	.0356195	27.384	0.000	.9050121	1.045773	
d60	-.0521288	.034144	-1.527	0.129	-.1195941	.0153366	
d70	.0074614	.0267987	0.278	0.781	-.0454903	.0604131	
d80	.0346018	.022413	1.544	0.125	-.0096841	.0788877	
cdum19	.0108997	.05679	0.192	0.848	-.1013119	.1231114	
cdum28	-.388894	.0767376	-5.068	0.000	-.5405202	-.2372677	
cdum37	-.0772231	.1004034	-0.769	0.443	-.2756107	.1211645	
cdum38	.0414406	.0535641	0.774	0.440	-.064397	.1472783	
cdum39	-.0555868	.06555	-0.848	0.398	-.1851075	.0739338	
cdum42	-.2588213	.0732063	-3.536	0.001	-.4034701	-.1141726	
cdum45	-.1501688	.0765427	-1.962	0.052	-.3014099	.0010724	
cdum56	-.1771719	.0822768	-2.153	0.033	-.3397432	-.0146007	
cdum81	-.4006423	.0811152	-4.939	0.000	-.5609181	-.2403664	
cdum86	-.3317598	.0779769	-4.255	0.000	-.4858348	-.1776848	
cdum90	-.0098565	.0596134	-0.165	0.869	-.127647	.1079339	
cdum92	.0719331	.0520932	1.381	0.169	-.0309981	.1748644	
cdum99	-.0640041	.0714692	-0.896	0.372	-.2052206	.0772123	
cdum108	.0649495	.0686745	0.946	0.346	-.0707448	.2006438	
cdum116	-.0350951	.0614241	-0.571	0.569	-.1564633	.0862731	
cdum122	-.0274759	.0797728	-0.344	0.731	-.1850994	.1301477	
cdum127	-.3073112	.0904004	-3.399	0.001	-.4859338	-.1286886	
cdum140	-.2041243	.0812314	-2.513	0.013	-.3646298	-.0436189	
cdum151	.1276305	.0761186	1.677	0.096	-.0227726	.2780336	
cdum153	.0504881	.0566568	0.891	0.374	-.0614604	.1624365	
cdum188	-.1546132	.0676161	-2.287	0.024	-.2882162	-.0210102	
cdum193	.0066827	.0831044	0.080	0.936	-.1575238	.1708891	
cdum194	-.2277722	.0832964	-2.734	0.007	-.3923579	-.0631865	
cdum196	-.0598902	.075526	-0.793	0.429	-.2091223	.089342	
cdum202	-.0353571	.0978131	-0.361	0.718	-.2286264	.1579123	
cdum156	-.2644339	.0658684	-4.015	0.000	-.3945836	-.1342843	
_cons	-.0804061	.248024	-0.324	0.746	-.5704779	.4096658	

```
. *Quintile 4;
. reg lrgdpq4 lrgdpl d60 d70 d80 cdum* if (agdps~=1 & sample==1);
```

Source	SS	df	MS	Number of obs	=	181
Model	68.600017	30	2.28666723	F(30, 150)	=	59.60
Residual	5.75505381	150	.038367025	Prob > F	=	0.0000
Total	74.3550708	180	.413083727	R-squared	=	0.9226
				Adj R-squared	=	0.9071
				Root MSE	=	.19588
-----	-----	-----	-----	-----	-----	-----
lrgdpq4	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
-----	-----	-----	-----	-----	-----	-----
lrgdpl	.9962121	.0865824	11.506	0.000	.8251336	1.167291
d60	-.0831433	.0829959	-1.002	0.318	-.2471354	.0808488
d70	.016453	.0651412	0.253	0.801	-.1122598	.1451658
d80	.0282199	.0544805	0.518	0.605	-.0794284	.1358682
cdum19	.0200682	.1380428	0.145	0.885	-.2526914	.2928278
cdum28	-.1697694	.1865307	-0.910	0.364	-.5383363	.1987976
cdum37	.0254953	.2440565	0.104	0.917	-.4567372	.5077279
cdum38	.1470192	.1302015	1.129	0.261	-.1102466	.404285
cdum39	-.0186071	.1593364	-0.117	0.907	-.3334407	.2962265
cdum42	-.1403618	.1779469	-0.789	0.431	-.491968	.2112445
cdum45	-.3663445	.186057	-1.969	0.051	-.7339755	.0012864
cdum56	-.0251875	.1999952	-0.126	0.900	-.4203591	.3699841
cdum81	-.1798635	.1971715	-0.912	0.363	-.5694557	.2097286
cdum86	-.0710864	.1895431	-0.375	0.708	-.4456057	.3034329
cdum90	-.0072773	.1449059	-0.050	0.960	-.2935976	.2790431
cdum92	.0390157	.1266261	0.308	0.758	-.2111854	.2892168
cdum99	.0001623	.1737245	0.001	0.999	-.3431009	.3434255
cdum108	.0659243	.1669312	0.395	0.693	-.263916	.3957645
cdum116	-.0451061	.1493072	-0.302	0.763	-.3401229	.2499108
cdum122	-.0196163	.1939086	-0.101	0.920	-.4027612	.3635287
cdum127	-.1228394	.2197416	-0.559	0.577	-.557028	.3113491
cdum140	-.0821156	.1974539	-0.416	0.678	-.4722658	.3080346
cdum151	.058192	.185026	0.315	0.754	-.3074018	.4237858
cdum153	-.0015608	.1377119	-0.011	0.991	-.2736804	.2705589
cdum188	-.0307492	.1643585	-0.187	0.852	-.3555059	.2940076
cdum193	.0358865	.2020069	0.178	0.859	-.36326	.435033
cdum194	-.0443868	.2024734	-0.219	0.827	-.4444551	.3556816
cdum196	-.0411226	.1835855	-0.224	0.823	-.4038701	.3216249
cdum202	.021022	.2377601	0.088	0.930	-.4487694	.4908133
cdum156	-.0465005	.1601102	-0.290	0.772	-.362863	.269862
_cons	.0972159	.6028866	0.161	0.872	-1.094031	1.288463

Regression results for Table 2, Panel B (Constrained System Estimation)

System: GDP2

Coefficient Std. Error t-Statistic Prob.

Quintile 1

Constant	0.3430	0.3523	0.9735	0.3306
Log Avg Y	0.7997	0.0506	15.8162	0.0000
d60	-0.1377	0.0489	-2.8152	0.0050
d70	-0.0974	0.0386	-2.5252	0.0117
d80	-0.0043	0.0323	-0.1324	0.8947
C(10)	0.1191	0.0819	1.4545	0.1462
C(11)	-0.6327	0.1098	-5.7638	0.0000
C(12)	-0.0948	0.1439	-0.6587	0.5103
C(13)	0.1003	0.0773	1.2984	0.1945
C(14)	-0.0008	0.0945	-0.0087	0.9931
C(15)	-0.2606	0.1050	-2.4823	0.0132
C(16)	-0.2350	0.1097	-2.1428	0.0324
C(17)	-0.2241	0.1184	-1.8927	0.0587
C(18)	-0.9326	0.1168	-7.9862	0.0000
C(19)	-0.9275	0.1124	-8.2507	0.0000
C(20)	0.2304	0.0859	2.6828	0.0074
C(21)	0.2672	0.0751	3.5569	0.0004
C(22)	-0.0890	0.1026	-0.8667	0.3863
C(23)	0.1943	0.0985	1.9729	0.0488
C(24)	0.0326	0.0884	0.3684	0.7127
C(25)	0.0760	0.1149	0.6617	0.5083
C(26)	-0.4227	0.1292	-3.2711	0.0011
C(27)	-0.2819	0.1164	-2.4219	0.0156
C(28)	0.5065	0.1090	4.6481	0.0000
C(29)	0.2854	0.0817	3.4942	0.0005
C(30)	-0.2107	0.0971	-2.1707	0.0302
C(31)	-0.0040	0.1196	-0.0337	0.9731
C(32)	-0.3467	0.1195	-2.9003	0.0038
C(33)	-0.0454	0.1090	-0.4164	0.6772
C(34)	0.0177	0.1396	0.1268	0.8991
C(151)	-0.3588	0.0948	-3.7837	0.0002

Quintile 2

Constant	-0.2924	0.3464	-0.8441	0.3988
Log Avg Y	0.9607	0.0497	19.3387	0.0000
d60	-0.0485	0.0486	-0.9993	0.3179
d70	-0.0180	0.0384	-0.4693	0.6390
d80	0.0254	0.0323	0.7871	0.4314
C(39)	0.0408	0.0818	0.4986	0.6181
C(40)	-0.6268	0.1087	-5.7640	0.0000
C(41)	-0.1614	0.1428	-1.1300	0.2588
C(42)	0.0553	0.0772	0.7159	0.4742
C(43)	-0.0831	0.0943	-0.8811	0.3785
C(44)	-0.3276	0.1043	-3.1416	0.0017
C(45)	-0.2106	0.1088	-1.9358	0.0532
C(46)	-0.2710	0.1180	-2.2964	0.0219
C(47)	-0.6286	0.1164	-5.3984	0.0000
C(48)	-0.5755	0.1122	-5.1274	0.0000
C(49)	0.0559	0.0857	0.6522	0.5144
C(50)	0.1234	0.0751	1.6445	0.1004
C(51)	-0.1329	0.1021	-1.3016	0.1934
C(52)	0.1168	0.0978	1.1942	0.2327
C(53)	0.0037	0.0881	0.0418	0.9667
C(54)	-0.0406	0.1146	-0.3545	0.7230
C(55)	-0.5190	0.1279	-4.0575	0.0001
C(56)	-0.2892	0.1155	-2.5044	0.0124
C(57)	0.2226	0.1080	2.0608	0.0396
C(58)	0.1144	0.0816	1.4026	0.1611
C(59)	-0.2130	0.0965	-2.2068	0.0276

	Coefficien	Std. Error	t-Statisti	Prob.
C(60)	-0.0599	0.1192	-0.5025	0.6154
C(61)	-0.2844	0.1188	-2.3935	0.0169
C(62)	-0.0556	0.1089	-0.5103	0.6100
C(63)	-0.1136	0.1379	-0.8236	0.4104
C(152)	-0.1858	0.0945	-1.9652	0.0497
Quinitle 3				
Constant	-0.1788	0.3402	-0.5255	0.5994
Log Avg Y	0.9898	0.0487	20.3039	0.0000
d60	-0.0429	0.0482	-0.8902	0.3736
d70	0.0123	0.0383	0.3221	0.7475
d80	0.0361	0.0323	1.1176	0.2640
C(68)	0.0044	0.0817	0.0543	0.9567
C(69)	-0.4118	0.1077	-3.8246	0.0001
C(70)	-0.1043	0.1417	-0.7359	0.4620
C(71)	0.0363	0.0771	0.4710	0.6377
C(72)	-0.0642	0.0941	-0.6822	0.4953
C(73)	-0.2775	0.1035	-2.6808	0.0075
C(74)	-0.1712	0.1079	-1.5866	0.1129
C(75)	-0.1918	0.1176	-1.6305	0.1033
C(76)	-0.4141	0.1161	-3.5672	0.0004
C(77)	-0.3412	0.1121	-3.0449	0.0024
C(78)	-0.0183	0.0855	-0.2136	0.8309
C(79)	0.0669	0.0750	0.8917	0.3728
C(80)	-0.0803	0.1015	-0.7915	0.4289
C(81)	0.0475	0.0971	0.4891	0.6249
C(82)	-0.0461	0.0878	-0.5252	0.5996
C(83)	-0.0399	0.1143	-0.3488	0.7273
C(84)	-0.3354	0.1266	-2.6502	0.0082
C(85)	-0.2264	0.1145	-1.9766	0.0484
C(86)	0.1057	0.1070	0.9875	0.3236
C(87)	0.0438	0.0814	0.5374	0.5911
C(88)	-0.1706	0.0959	-1.7788	0.0756
C(89)	-0.0083	0.1188	-0.0699	0.9443
C(90)	-0.2480	0.1180	-2.1010	0.0359
C(91)	-0.0531	0.1088	-0.4885	0.6253
C(92)	-0.0682	0.1362	-0.5009	0.6166
C(153)	-0.2757	0.0942	-2.9255	0.0035
Quinitle 4				
Constant	-0.0110	0.3253	-0.0337	0.9731
Log Avg Y	1.0121	0.0465	21.7582	0.0000
d60	-0.0730	0.0472	-1.5446	0.1228
d70	0.0218	0.0380	0.5744	0.5658
d80	0.0299	0.0323	0.9258	0.3548
C(97)	0.0130	0.0814	0.1592	0.8736
C(98)	-0.1950	0.1051	-1.8546	0.0640
C(99)	-0.0042	0.1390	-0.0304	0.9757
C(100)	0.1414	0.0769	1.8377	0.0664
C(101)	-0.0281	0.0937	-0.2997	0.7644
C(102)	-0.1610	0.1018	-1.5814	0.1141
C(103)	-0.3895	0.1058	-3.6821	0.0002
C(104)	-0.0413	0.1167	-0.3535	0.7238
C(105)	-0.1947	0.1153	-1.6889	0.0916
C(106)	-0.0815	0.1117	-0.7298	0.4657
C(107)	-0.0165	0.0851	-0.1942	0.8461
C(108)	0.0334	0.0748	0.4471	0.6549
C(109)	-0.0178	0.1001	-0.1777	0.8590
C(110)	0.0468	0.0955	0.4894	0.6247
C(111)	-0.0572	0.0871	-0.6571	0.5113
C(112)	-0.0332	0.1136	-0.2926	0.7699
C(113)	-0.1537	0.1233	-1.2465	0.2129

	Coefficien	Std.	Error	t-Statisti	Prob.
C(114)	-0.1066	0.1123	-0.9492	0.3428	
C(115)	0.0341	0.1047	0.3254	0.7450	
C(116)	-0.0090	0.0812	-0.1103	0.9122	
C(117)	-0.0483	0.0945	-0.5114	0.6092	
C(118)	0.0194	0.1178	0.1647	0.8692	
C(119)	-0.0666	0.1162	-0.5733	0.5666	
C(120)	-0.0337	0.1086	-0.3103	0.7564	
C(121)	-0.0151	0.1321	-0.1145	0.9089	
C(154)	-0.0589	0.0935	-0.6294	0.5293	
Quintile 5					
Constant	0.5879	0.1953	3.0098	0.0027	
Log Avg Y	1.0287	0.0267	38.5534	0.0000	
d60	0.0353	0.0404	0.8737	0.3825	
d70	0.0002	0.0357	0.0063	0.9950	
d80	-0.0180	0.0320	-0.5609	0.5750	
C(126)	-0.0219	0.0796	-0.2756	0.7829	
C(127)	0.3237	0.0859	3.7691	0.0002	
C(128)	0.1113	0.1192	0.9336	0.3508	
C(129)	-0.1362	0.0757	-1.7977	0.0726	
C(130)	0.0565	0.0909	0.6221	0.5340	
C(131)	0.2341	0.0889	2.6327	0.0086	
C(132)	0.1831	0.0900	2.0348	0.0422	
C(133)	0.1559	0.1101	1.4157	0.1572	
C(134)	0.3505	0.1096	3.1975	0.0014	
C(135)	0.2983	0.1088	2.7417	0.0062	
C(136)	-0.0315	0.0822	-0.3836	0.7014	
C(137)	-0.0928	0.0736	-1.2615	0.2075	
C(138)	0.0865	0.0904	0.9569	0.3389	
C(139)	-0.0723	0.0837	-0.8636	0.3880	
C(140)	0.0359	0.0821	0.4369	0.6623	
C(141)	0.0398	0.1088	0.3660	0.7144	
C(142)	0.2708	0.0985	2.7504	0.0061	
C(143)	0.2017	0.0957	2.1086	0.0352	
C(144)	-0.1750	0.0872	-2.0080	0.0449	
C(145)	-0.0808	0.0792	-1.0208	0.3076	
C(146)	0.1533	0.0845	1.8138	0.0700	
C(147)	0.0460	0.1109	0.4149	0.6783	
C(148)	0.1979	0.1032	1.9173	0.0555	
C(149)	0.0494	0.1071	0.4614	0.6446	
C(150)	0.0573	0.0994	0.5759	0.5648	
C(155)	0.1941	0.0887	2.1891	0.0288	

Determinant residual 2.39E-16

Equation: LRGDPQ1=C(1) + C(2)*LRGDPL + C(7)*D60 + C(8)*D70 +
C(9)*D80 + C(10)*CDUM19 + C(11)*CDUM28 + C(12)*CDUM37 +
C(13)*CDUM38 + C(14)*CDUM39 + C(15)*CDUM42 +
C(16)*CDUM45 + C(17)*CDUM56 + C(18)*CDUM81 +
C(19)*CDUM86 + C(20)*CDUM90 + C(21)*CDUM92 +
C(22)*CDUM99 + C(23)*CDUM108 + C(24)*CDUM116 +
C(25)*CDUM122 + C(26)*CDUM127 + C(27)*CDUM140 +
C(28)*CDUM151 + C(29)*CDUM153 + C(30)*CDUM188 +
C(31)*CDUM193 + C(32)*CDUM194 + C(33)*CDUM196 +
C(34)*CDUM202 +C(151)*CDUM156

Observations: 181

R-squared	0.923721	Mean dependent v	6.315036
Adjusted R	0.908466	S.D. dependent v	0.520442
S.E. of re	0.157458	Sum squared resi	3.718947
Durbin-Wat	1.815582		

Coefficien Std. Error t-Statisti Prob.

Equation: LRGDPQ2=C(35) + C(3)*LRGDPL + C(36)*D60 + C(37)*D70 +
C(38)*D80 + C(39)*CDUM19 + C(40)*CDUM28 + C(41)*CDUM37 +
C(42)*CDUM38 + C(43)*CDUM39 + C(44)*CDUM42 +
C(45)*CDUM45 + C(46)*CDUM56 + C(47)*CDUM81 +
C(48)*CDUM86 + C(49)*CDUM90 + C(50)*CDUM92 +
C(51)*CDUM99 + C(52)*CDUM108 + C(53)*CDUM116 +
C(54)*CDUM122 + C(55)*CDUM127 + C(56)*CDUM140 +
C(57)*CDUM151 + C(58)*CDUM153 + C(59)*CDUM188 +
C(60)*CDUM193 + C(61)*CDUM194 + C(62)*CDUM196 +
C(63)*CDUM202 +C(152)*CDUM156

Observations: 181

R-squared 0.971656 Mean dependent v 6.882005
Adjusted R 0.965987 S.D. dependent v 0.549487
S.E. of re 0.10134 Sum squared resi 1.540456
Durbin-Wat 1.941681

Equation: LRGDPQ3=C(64) + C(4)*LRGDPL + C(65)*D60 + C(66)*D70 +
C(67)*D80 + C(68)*CDUM19 + C(69)*CDUM28 + C(70)*CDUM37 +
C(71)*CDUM38 + C(72)*CDUM39 + C(73)*CDUM42 +
C(74)*CDUM45 + C(75)*CDUM56 + C(76)*CDUM81 +
C(77)*CDUM86 + C(78)*CDUM90 + C(79)*CDUM92 +
C(80)*CDUM99 + C(81)*CDUM108 + C(82)*CDUM116 +
C(83)*CDUM122 + C(84)*CDUM127 + C(85)*CDUM140 +
C(86)*CDUM151 + C(87)*CDUM153 + C(88)*CDUM188 +
C(89)*CDUM193 + C(90)*CDUM194 + C(91)*CDUM196 +
C(92)*CDUM202 +C(153)*CDUM156

Observations: 181

R-squared 0.984175 Mean dependent v 7.240112
Adjusted R 0.98101 S.D. dependent v 0.585082
S.E. of re 0.080626 Sum squared resi 0.975077
Durbin-Wat 1.979314

Equation: LRGDPQ4=C(93) + C(5)*LRGDPL + C(94)*D60 + C(95)*D70
+ C(96)*D80 + C(97)*CDUM19 + C(98)*CDUM28 + C(99)*CDUM37
+ C(100)*CDUM38 + C(101)*CDUM39 + C(102)*CDUM42 +
C(103)*CDUM45 + C(104)*CDUM56 + C(105)*CDUM81 +
C(106)*CDUM86 + C(107)*CDUM90 + C(108)*CDUM92 +
C(109)*CDUM99 + C(110)*CDUM108 + C(111)*CDUM116 +
C(112)*CDUM122 + C(113)*CDUM127 + C(114)*CDUM140 +
C(115)*CDUM151 + C(116)*CDUM153 + C(117)*CDUM188 +
C(118)*CDUM193 + C(119)*CDUM194 + C(120)*CDUM196 +
C(121)*CDUM202 +C(154)*CDUM156

Observations: 181

R-squared 0.922583 Mean dependent v 7.61826
Adjusted R 0.9071 S.D. dependent v 0.642716
S.E. of re 0.195897 Sum squared resi 5.756339
Durbin-Wat 2.038583

Equation: LRGDPQ5=C(122) + C(6)*LRGDPL + C(123)*D60 +
C(124)*D70 + C(125)*D80 + C(126)*CDUM19 + C(127)*CDUM28 +
C(128)*CDUM37 + C(129)*CDUM38 + C(130)*CDUM39 +
C(131)*CDUM42 + C(132)*CDUM45 + C(133)*CDUM56 +
C(134)*CDUM81 + C(135)*CDUM86 + C(136)*CDUM90 +
C(137)*CDUM92 + C(138)*CDUM99 + C(139)*CDUM108 +
C(140)*CDUM116 + C(141)*CDUM122 + C(142)*CDUM127 +
C(143)*CDUM140 + C(144)*CDUM151 + C(145)*CDUM153 +

Coefficien Std. Error t-Statisti Prob.
C(146)*CDUM188 + C(147)*CDUM193 + C(148)*CDUM194 +
C(149)*CDUM196 + C(150)*CDUM202 +C(155)*CDUM156

Observations: 181

R-squared 0.993912 Mean dependent v 8.427389
Adjusted R 0.992695 S.D. dependent v 0.739115
S.E. of re 0.063172 Sum squared resi 0.598613
Durbin-Wat 1.96835

Equation: QUNTILE1*C(2)+(QUNTILE2-QUNTILE1)*C(3)
+(QUNTILE3-QUNTILE2)*C(4)+(QUNTILE4-QUNTILE3)*C(5)
+(1-QUNTILE4)*C(6)=1

Observations: 181

S.E. of re 0.008031 Sum squared resi 0.011352
Durbin-Wat 0.365791

Appendix D

Details of Quintile-Specific Regressions for Table 3

Dummy Variable	Country Code	Country Name
cdum19	BGD	Bangladesh
cdum28	BRA	Brazil
cdum37	CHL	Chile
cdum38	CHN	China
cdum39	CIV	Ivory Coast
cdum42	COL	Columbia
cdum45	CRI	Costa Rica
cdum56	DOM	Dominican Republic
cdum81	GTM	Guatemala
cdum86	HND	Honduras
cdum90	IDN	Indonesia
cdum92	IND	India
cdum99	JAM	Jamaica
cdum108	KOR	South Korea
cdum116	LKA	Sri Lanka
cdum122	MAR	Morocco
cdum127	MEX	Mexico
cdum140	MYS	Malaysia
cdum151	OAN	Taiwan
cdum153	PAK	Pakistan
cdum156	PHL	Philippines
cdum188	THA	Thailand
cdum193	TUN	Tunisia
cdum194	TUR	Turkey
cdum196	UGA	Uganda
cdum202	VEN	Venezuela
Not listed	GHA	Ghana

Regression results for Table 3, Panel A (Unconstrained)

```
. *Interaction with wgt2 added;
. *Quintile 1;
. reg lrgdpql wlagpc wlnagdpl wgt2 wgt2nag wgt2ag d60 d70 d80 cdum* if sample==> 1;
```

Source	SS	df	MS	Number of obs	=	181
Model	45.6874337	34	1.34374805	F(34, 146)	=	63.96
Residual	3.06731225	146	.021008988	Prob > F	=	0.0000
Total	48.754746	180	.2708597	R-squared	=	0.9371

lrgdpql	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
wlagpc	1.159593	.1879403	6.170	0.000	.7881582 1.531028
wlnagdpl	1.026123	.1109597	9.248	0.000	.8068288 1.245418
wgt2	5.095879	1.445961	3.524	0.001	2.238161 7.953597
wgt2nag	-.5755173	.1496274	-3.846	0.000	-.8712327 -.2798018
wgt2ag	-.9003801	.2521581	-3.571	0.000	-1.398732 -.4020285
d60	-.1131243	.0665404	-1.700	0.091	-.2446312 .0183826
d70	-.0560906	.0536299	-1.046	0.297	-.1620818 .0499005
d80	.0082484	.040939	0.201	0.841	-.0726612 .089158
cdum19	.0649381	.1328817	0.489	0.626	-.1976821 .3275583
cdum28	-.2791627	.1516609	-1.841	0.068	-.578897 .0205716
cdum37	.0731537	.2172754	0.337	0.737	-.3562575 .502565
cdum38	.3942853	.1046464	3.768	0.000	.1874679 .6011027
cdum39	.217878	.1228907	1.773	0.078	-.0249966 .4607526
cdum42	-.0596255	.1537463	-0.388	0.699	-.3634814 .2442305
cdum45	.0337305	.1540787	0.219	0.827	-.2707822 .3382432
cdum56	-.1987243	.1851746	-1.073	0.285	-.5646934 .1672448
cdum81	-.5548599	.1562078	-3.552	0.001	-.8635805 -.2461393
cdum86	-.797725	.1610919	-4.952	0.000	-.1116098 -.4793517
cdum90	.3840899	.1036761	3.705	0.000	.17919 .5889897
cdum92	.3494677	.0945744	3.695	0.000	.162556 .5363794
cdum99	-.0122856	.1817741	-0.068	0.946	-.3715341 .3469629
cdum108	.2156304	.1277061	1.688	0.093	-.0367611 .4680218
cdum116	.1633932	.1153364	1.417	0.159	-.0645514 .3913377
cdum122	.2173701	.1407575	1.544	0.125	-.0608154 .4955555
cdum127	.0954847	.1654109	0.577	0.565	-.2314245 .4223939
cdum140	.0905278	.157621	0.574	0.567	-.2209858 .4020413
cdum151	.4822829	.141892	3.399	0.001	.2018553 .7627105
cdum153	.3800985	.1006051	3.778	0.000	.1812682 .5789289
cdum188	.5422276	.1305482	4.153	0.000	.2842192 .800236
cdum193	.188673	.1722568	1.095	0.275	-.1517659 .5291118
cdum194	.3163385	.1698249	1.863	0.065	-.0192943 .6519712
cdum196	.2260028	.1580024	1.430	0.155	-.0862646 .5382701
cdum202	.2618906	.2036444	1.286	0.200	-.1405811 .6643623
cdum156	-.1357338	.1389923	-0.977	0.330	-.4104306 .1389629
_cons	-1.695481	1.048788	-1.617	0.108	-.3.768249 .3772875

```
. *Quintile 2;
. reg lrgdpq2 wlagpc wlnagdp1 wgt2 wgt2nag wgt2ag d60 d70 d80 cdum* if sample==
> 1;
```

Source	SS	df	MS	Number of obs	=	181
Model	52.8446314	34	1.55425386	F(34, 146)	=	150.90
Residual	1.50375828	146	.010299714	Prob > F	=	0.0000
Total	54.3483897	180	.301935498	R-squared	=	0.9723

lrgdpq2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
wlagpc	1.048519	.1315922	7.968	0.000	.7884471 1.30859
wlnagdp1	.9991872	.0776918	12.861	0.000	.8456414 1.152733
wgt2	1.305826	1.012433	1.290	0.199	-.6950922 3.306744
wgt2nag	-.1723443	.1047662	-1.645	0.102	-.3793985 .0347099
wgt2ag	-.2376366	.1765562	-1.346	0.180	-.5865727 .1112996
d60	-.0869016	.0465903	-1.865	0.064	-.1789802 .005177
d70	-.0449458	.0375506	-1.197	0.233	-.1191587 .0292671
d80	.0094211	.0286647	0.329	0.743	-.0472302 .0660724
cdum19	.1322649	.0930412	1.422	0.157	-.0516167 .3161464
cdum28	-.1831756	.10619	-1.725	0.087	-.3930437 .0266926
cdum37	.2264577	.152132	1.489	0.139	-.0742076 .5271231
cdum38	.4562236	.0732714	6.226	0.000	.3114141 .6010332
cdum39	.19911592	.0860457	2.315	0.022	.0291031 .3692152
cdum42	-.0474092	.1076502	-0.440	0.660	-.2601632 .1653448
cdum45	.0955284	.1078829	0.885	0.377	-.1176855 .3087422
cdum56	-.052707	.1296557	-0.407	0.685	-.3089514 .2035374
cdum81	-.2804647	.1093736	-2.564	0.011	-.4966248 -.0643046
cdum86	-.3433863	.1127934	-3.044	0.003	-.566305 -.1204675
cdum90	.2960734	.072592	4.079	0.000	.1526065 .4395403
cdum92	.2721379	.0662191	4.110	0.000	.141266 .4030098
cdum99	.2172002	.1272747	1.707	0.090	-.0343386 .468739
cdum108	.2487341	.0894173	2.782	0.006	.0720146 .4254537
cdum116	.2088013	.0807563	2.586	0.011	.049199 .3684037
cdum122	.1878447	.0985556	1.906	0.059	-.0069353 .3826248
cdum127	.0249948	.1158175	0.216	0.829	-.2039006 .2538902
cdum140	.0482292	.1103632	0.437	0.663	-.1698866 .2663449
cdum151	.3593739	.09935	3.617	0.000	.163024 .5557239
cdum153	.2693463	.0704417	3.824	0.000	.1301291 .4085634
cdum188	.5236909	.0914073	5.729	0.000	.3430385 .7043434
cdum193	.2899996	.1206108	2.404	0.017	.051631 .5283683
cdum194	.1997746	.1189081	1.680	0.095	-.0352289 .4347781
cdum196	.2553083	.1106302	2.308	0.022	.0366648 .4739518
cdum202	.2631023	.1425878	1.845	0.067	-.0187005 .5449052
cdum156	.1484581	.0973197	1.525	0.129	-.0438792 .3407954
_cons	-.7117037	.7343411	-0.969	0.334	-2.163016 .7396081

```

. *Quintile 3;
. reg lrgdpq3 wlagpc wlnagdpl wgt2 wgt2nag wgt2ag d60 d70 d80 cdum* if sample==
> 1;

```

Source	SS	df	MS	Number of obs	=	181
Model	60.5388068	34	1.78055314	F(34, 146)	=	240.92
Residual	1.07905304	146	.007390774	Prob > F	=	0.0000
Total	61.6178598	180	.342321443	R-squared	=	0.9825

lrgdpq3	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
wlagpc	1.020903	.1114711	9.158	0.000	.8005972 1.241208
wlnagdpl	.9805669	.0658124	14.899	0.000	.8504989 1.110635
wgt2	.1694169	.8576278	0.198	0.844	-1.525552 1.864386
wgt2nag	-.0265625	.088747	-0.299	0.765	-.2019571 .1488322
wgt2ag	-.0429634	.14956	-0.287	0.774	-.3385457 .2526188
d60	-.0865655	.0394665	-2.193	0.030	-.1645649 -.0085662
d70	-.0218699	.0318089	-0.688	0.493	-.0847353 .0409955
d80	.0113412	.0242817	0.467	0.641	-.0366478 .0593303
cdum19	.1138216	.0788148	1.444	0.151	-.0419437 .2695868
cdum28	-.0642214	.0899531	-0.714	0.476	-.2419997 .113557
cdum37	.2068762	.1288703	1.605	0.111	-.0478161 .4615685
cdum38	.4517891	.0620678	7.279	0.000	.3291216 .5744566
cdum39	.1986355	.0728889	2.725	0.007	.0545818 .3426892
cdum42	-.0894928	.09119	-0.981	0.328	-.2697158 .0907301
cdum45	.0284093	.0913871	0.311	0.756	-.1522032 .2090218
cdum56	-.0267325	.1098307	-0.243	0.808	-.243796 .190331
cdum81	-.1603824	.0926499	-1.731	0.086	-.3434907 .0227259
cdum86	-.1582713	.0955468	-1.656	0.100	-.3471048 .0305622
cdum90	.2405121	.0614924	3.911	0.000	.118982 .3620423
cdum92	.2182981	.0560939	3.892	0.000	.1074371 .3291592
cdum99	.2324384	.1078138	2.156	0.033	.019361 .4455158
cdum108	.2008771	.075745	2.652	0.009	.0511788 .3505755
cdum116	.1361366	.0684083	1.990	0.048	.0009382 .271335
cdum122	.2176635	.083486	2.607	0.010	.0526662 .3826608
cdum127	.0874339	.0981085	0.891	0.374	-.1064624 .2813301
cdum140	-.0172958	.0934881	-0.185	0.853	-.2020607 .1674691
cdum151	.2884475	.0841589	3.427	0.001	.1221204 .4547747
cdum153	.2098517	.0596708	3.517	0.001	.0919215 .3277819
cdum188	.4866834	.0774307	6.285	0.000	.3336535 .6397133
cdum193	.2898563	.1021689	2.837	0.005	.0879353 .4917774
cdum194	.0943244	.1007265	0.936	0.351	-.104746 .2933948
cdum196	.2500417	.0937143	2.668	0.008	.0648297 .4352536
cdum202	.2030822	.1207855	1.681	0.095	-.0356317 .4417962
cdum156	.011741	.0824391	0.142	0.887	-.1511871 .174669
_cons	-.2349117	.6220571	-0.378	0.706	-.1.464311 .9944881

```

. *Quintile 4;
. reg lrgdpq4 wlagpc wlnagdpl wgt2 wgt2nag wgt2ag d60 d70 d80 cdum* if sample==
> 1;

```

Source	SS	df	MS	Number of obs	=	181
Model	68.5362269	34	2.01577138	F(34, 146)	=	50.58
Residual	5.81884389	146	.039855095	Prob > F	=	0.0000
Total	74.3550708	180	.413083727	R-squared	=	0.9217
				Adj R-squared	=	0.9035
				Root MSE	=	.19964
-----	-----	-----	-----	-----	-----	-----
lrgdpq4	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
wlagpc	1.049594	.2588567	4.055	0.000	.5380035	1.561184
wlnagdpl	1.012351	.1528286	6.624	0.000	.7103094	1.314394
wgt2	.800635	1.991571	0.402	0.688	-3.135398	4.736668
wgt2nag	-.0739808	.2060869	-0.359	0.720	-.4812798	.3333182
wgt2ag	-.1610798	.3473061	-0.464	0.643	-.8474767	.525317
d60	-.0856688	.0916484	-0.935	0.351	-.2667978	.0954602
d70	.0164342	.0738662	0.222	0.824	-.129551	.1624194
d80	.0079277	.0563867	0.141	0.888	-.1035119	.1193672
cdum19	.1114718	.1830226	0.609	0.543	-.250244	.4731877
cdum28	.0533771	.2088877	0.256	0.799	-.3594572	.4662115
cdum37	.1348615	.2992608	0.451	0.653	-.4565813	.7263043
cdum38	.569307	.1441331	3.950	0.000	.2844502	.8541638
cdum39	.2302518	.1692616	1.360	0.176	-.1042677	.5647713
cdum42	-.0755978	.2117601	-0.357	0.722	-.494109	.3429134
cdum45	-.2800036	.2122178	-1.319	0.189	-.6994194	.1394122
cdum56	-.0164503	.2550474	-0.064	0.949	-.520512	.4876115
cdum81	.036048	.2151503	0.168	0.867	-.3891634	.4612594
cdum86	.0292774	.2218774	0.132	0.895	-.409229	.4677838
cdum90	.2366514	.1427967	1.657	0.100	-.0455642	.518867
cdum92	.1725421	.1302606	1.325	0.187	-.0848978	.4299819
cdum99	.1309041	.2503638	0.523	0.602	-.3639012	.6257094
cdum108	.1660308	.175894	0.944	0.347	-.1815966	.5136581
cdum116	.0893012	.1588567	0.562	0.575	-.2246546	.403257
cdum122	.2211082	.1938701	1.140	0.256	-.1620461	.6042625
cdum127	.1921748	.2278262	0.844	0.400	-.2580884	.6424381
cdum140	.0394653	.2170968	0.182	0.856	-.389593	.4685237
cdum151	.1814778	.1954327	0.929	0.355	-.2047648	.5677203
cdum153	.145869	.1385668	1.053	0.294	-.1279869	.4197248
cdum188	.6348532	.1798085	3.531	0.001	.2794894	.990217
cdum193	.2152044	.2372551	0.907	0.366	-.2536937	.6841025
cdum194	.3108297	.2339057	1.329	0.186	-.1514488	.7731082
cdum196	.3000953	.2176221	1.379	0.170	-.1300012	.7301919
cdum202	.101974	.2804864	0.364	0.717	-.4523641	.6563121
cdum156	.1665546	.1914388	0.870	0.386	-.2117946	.5449038
_cons	-.1204395	1.444532	-0.083	0.934	-2.975334	2.734455

```
. *Quintile 5;
. reg lrgdpq5 wlagpc wlnagdp1 wgt2 wgt2nag wgt2ag d60 d70 d80 cdum* if sample ==
> 1;
```

Source	SS	df	MS	Number of obs	=	181
Model	97.4401054	34	2.86588545	F(34, 146)	=	468.97
Residual	.892199832	146	.006110958	Prob > F	=	0.0000
Total	98.3323052	180	.546290585	R-squared	=	0.9909

lrgdpq5	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
wlagpc	1.072926	.1013613	10.585	0.000	.872601 1.273251
wlnagdp1	.9879613	.0598435	16.509	0.000	.8696898 1.106233
wgt2	-.7243831	.7798454	-0.929	0.354	-2.265627 .8168609
wgt2nag	.0712309	.0806981	0.883	0.379	-.0882563 .2307182
wgt2ag	.1806942	.1359957	1.329	0.186	-.0880803 .4494686
d60	-.1010005	.0358871	-2.814	0.006	-.1719257 -.0300752
d70	-.0969386	.028924	-3.351	0.001	-.1541024 -.0397747
d80	-.0552674	.0220795	-2.503	0.013	-.0989041 -.0116307
cdum19	.0926143	.0716667	1.292	0.198	-.0490239 .2342524
cdum28	.6047648	.0817948	7.394	0.000	.4431101 .7664196
cdum37	.5254003	.1171825	4.484	0.000	.2938073 .7569934
cdum38	.2672748	.0564386	4.736	0.000	.1557326 .3788171
cdum39	.1856602	.0662783	2.801	0.006	.0546714 .316649
cdum42	.3416959	.0829195	4.121	0.000	.1778182 .5055735
cdum45	.2841667	.0830988	3.420	0.001	.1199348 .4483986
cdum56	.3298421	.0998697	3.303	0.001	.1324651 .5272191
cdum81	.3501715	.0842471	4.156	0.000	.1836702 .5166728
cdum86	.3306598	.0868812	3.806	0.000	.1589525 .502367
cdum90	.2706047	.0559153	4.840	0.000	.1600967 .3811127
cdum92	.0911775	.0510065	1.788	0.076	-.009629 .191984
cdum99	.471768	.0980357	4.812	0.000	.2780157 .6655204
cdum108	.1841058	.0688753	2.673	0.008	.0479843 .3202273
cdum116	.1565501	.062204	2.517	0.013	.0336135 .2794867
cdum122	.360116	.0759143	4.744	0.000	.2100831 .5101489
cdum127	.5900555	.0892106	6.614	0.000	.4137446 .7663664
cdum140	.2473664	.0850092	2.910	0.004	.0793587 .415374
cdum151	.1567769	.0765262	2.049	0.042	.0055347 .308019
cdum153	.1332754	.054259	2.456	0.015	.0260408 .24051
cdum188	.4759772	.0704082	6.760	0.000	.3368263 .615128
cdum193	.2777721	.0929027	2.990	0.003	.0941643 .4613799
cdum194	.1648186	.0915912	1.800	0.074	-.0161972 .3458344
cdum196	.1027013	.0852149	1.205	0.230	-.0657128 .2711155
cdum202	.4380861	.1098309	3.989	0.000	.2210223 .6551499
cdum156	.3154278	.0749623	4.208	0.000	.1672765 .4635792
_cons	.5776665	.5656397	1.021	0.309	-.540233 1.695566

```
. log close;
```

Regression results for Table 3, Panel B (Constrained System Estimation)

System: AGNAGGDP

Estimation Method: Least Squares

Date: 12/08/97 Time: 14:31

Sample: 1 181

	Coefficient	Std. Error	t-Statistic	Prob.
Quintile 1				
Constant	-1.6219	0.7609	-2.1316	0.0333
Ag pc Y	1.1464	0.1364	8.4080	0.0000
NAg pc Y	1.0184	0.0805	12.6452	0.0000
Wgt*Ag pc Y	-0.8890	0.1836	-4.8408	0.0000
Wgt*NAg pc Y	-0.5691	0.1090	-5.2202	0.0000
Wgt	5.0319	1.0532	4.7775	0.0000
d60	-0.1139	0.0488	-2.3327	0.0198
d70	-0.0569	0.0393	-1.4454	0.1486
d80	0.0077	0.0300	0.2566	0.7975
C(10)	0.0710	0.0971	0.7313	0.4648
C(11)	-0.2768	0.1113	-2.4874	0.0130
C(12)	0.0753	0.1595	0.4722	0.6369
C(13)	0.3969	0.0767	5.1745	0.0000
C(14)	0.2206	0.0901	2.4472	0.0146
C(15)	-0.0574	0.1128	-0.5091	0.6108
C(16)	0.0361	0.1131	0.3195	0.7494
C(17)	-0.1971	0.1359	-1.4506	0.1472
C(18)	-0.5526	0.1146	-4.8205	0.0000
C(19)	-0.7963	0.1182	-6.7351	0.0000
C(20)	0.3851	0.0761	5.0604	0.0000
C(21)	0.3511	0.0694	5.0598	0.0000
C(22)	-0.0111	0.1334	-0.0830	0.9339
C(23)	0.2168	0.0937	2.3132	0.0209
C(24)	0.1650	0.0846	1.9499	0.0514
C(25)	0.2179	0.1033	2.1090	0.0352
C(26)	0.0982	0.1214	0.8091	0.4186
C(27)	0.0933	0.1157	0.8064	0.4202
C(28)	0.4843	0.1041	4.6511	0.0000
C(29)	0.3805	0.0739	5.1511	0.0000
C(30)	0.5444	0.0958	5.6827	0.0000
C(31)	0.1901	0.1264	1.5038	0.1329
C(32)	0.3194	0.1246	2.5638	0.0105
C(33)	0.2275	0.1160	1.9617	0.0500
C(34)	0.2644	0.1495	1.7692	0.0771
C(171)	-0.1340	0.1020	-1.3135	0.1893
Quintile 2				
Constant	-0.5981	0.7479	-0.7996	0.4241
Ag pc Y	1.0282	0.1340	7.6717	0.0000
NAg pc Y	0.9873	0.0792	12.4624	0.0000
Wgt*Ag pc Y	-0.2211	0.1813	-1.2197	0.2228
Wgt*NAg pc Y	-0.1630	0.1077	-1.5143	0.1303
Wgt	1.2132	1.0399	1.1666	0.2436
d60	-0.0882	0.0488	-1.8062	0.0712
d70	-0.0461	0.0393	-1.1729	0.2411
d80	0.0086	0.0300	0.2867	0.7744
C(39)	0.1416	0.0964	1.4691	0.1421
C(40)	-0.1795	0.1112	-1.6138	0.1069
C(41)	0.2297	0.1594	1.4407	0.1500
C(42)	0.4603	0.0765	6.0139	0.0000
C(43)	0.2033	0.0900	2.2594	0.0241
C(44)	-0.0440	0.1128	-0.3901	0.6965
C(45)	0.0994	0.1130	0.8798	0.3792
C(46)	-0.0505	0.1358	-0.3720	0.7100

	Coefficient	Std. Error	t-Statistic	Prob.
C(47)	-0.2768	0.1146	-2.4163	0.0158
C(48)	-0.3414	0.1182	-2.8887	0.0039
C(49)	0.2976	0.0761	3.9123	0.0001
C(50)	0.2746	0.0693	3.9619	0.0001
C(51)	0.2187	0.1332	1.6414	0.1010
C(52)	0.2507	0.0937	2.6748	0.0076
C(53)	0.2113	0.0846	2.4987	0.0126
C(54)	0.1888	0.1033	1.8268	0.0680
C(55)	0.0295	0.1213	0.2435	0.8077
C(56)	0.0528	0.1155	0.4570	0.6478
C(57)	0.3626	0.1041	3.4842	0.0005
C(58)	0.2699	0.0739	3.6545	0.0003
C(59)	0.5273	0.0957	5.5098	0.0000
C(60)	0.2921	0.1264	2.3114	0.0210
C(61)	0.2051	0.1243	1.6502	0.0992
C(62)	0.2574	0.1159	2.2213	0.0265
C(63)	0.2672	0.1494	1.7885	0.0740
C(172)	0.1511	0.1019	1.4824	0.1385

	Quintile 3			
Constant	-0.0851	0.7309	-0.1164	0.9073
Ag pc Y	0.9942	0.1310	7.5897	0.0000
NAg pc Y	0.9649	0.0775	12.4500	0.0000
Wgt*Ag pc Y	-0.0223	0.1780	-0.1255	0.9002
Wgt*NAg pc Y	-0.0150	0.1057	-0.1417	0.8873
Wgt	0.0538	1.0209	0.0527	0.9580
d60	-0.0883	0.0488	-1.8093	0.0707
d70	-0.0233	0.0392	-0.5946	0.5522
d80	0.0103	0.0300	0.3430	0.7317
C(68)	0.1260	0.0954	1.3204	0.1870
C(69)	-0.0592	0.1111	-0.5332	0.5940
C(70)	0.2110	0.1593	1.3243	0.1857
C(71)	0.4571	0.0763	5.9899	0.0000
C(72)	0.2042	0.0898	2.2731	0.0232
C(73)	-0.0849	0.1127	-0.7539	0.4511
C(74)	0.0337	0.1129	0.2985	0.7654
C(75)	-0.0241	0.1356	-0.1778	0.8589
C(76)	-0.1554	0.1145	-1.3575	0.1749
C(77)	-0.1558	0.1181	-1.3191	0.1874
C(78)	0.2426	0.0760	3.1898	0.0015
C(79)	0.2216	0.0692	3.2007	0.0014
C(80)	0.2340	0.1330	1.7594	0.0788
C(81)	0.2035	0.0937	2.1723	0.0300
C(82)	0.1395	0.0845	1.6506	0.0991
C(83)	0.2189	0.1033	2.1189	0.0343
C(84)	0.0938	0.1211	0.7745	0.4388
C(85)	-0.0109	0.1153	-0.0947	0.9245
C(86)	0.2928	0.1040	2.8155	0.0050
C(87)	0.2106	0.0739	2.8516	0.0044
C(88)	0.4917	0.0955	5.1464	0.0000
C(89)	0.2924	0.1263	2.3157	0.0208
C(90)	0.1020	0.1238	0.8242	0.4100
C(91)	0.2526	0.1158	2.1821	0.0293
C(92)	0.2087	0.1493	1.3976	0.1625
C(173)	0.0150	0.1018	0.1478	0.8825

	Quintile 4			
Constant	0.0835	0.6954	0.1201	0.9044
Ag pc Y	1.0132	0.1246	8.1307	0.0000
NAg pc Y	0.9909	0.0739	13.4100	0.0000

	Coefficient	Std. Error	t-Statistic	Prob.
Wgt*Ag pc Y	-0.1347	0.1704	-0.7901	0.4296
Wgt*NAg pc Y	-0.0593	0.1014	-0.5846	0.5589
Wgt	0.6531	0.9779	0.6679	0.5044
d60	-0.0880	0.0487	-1.8067	0.0711
d70	0.0145	0.0391	0.3710	0.7107
d80	0.0065	0.0299	0.2179	0.8276
C(97)	0.1280	0.0936	1.3682	0.1715
C(98)	0.0603	0.1109	0.5439	0.5866
C(99)	0.1403	0.1591	0.8815	0.3782
C(100)	0.5765	0.0759	7.5996	0.0000
C(101)	0.2378	0.0895	2.6585	0.0080
C(102)	-0.0693	0.1125	-0.6165	0.5377
C(103)	-0.2725	0.1126	-2.4203	0.0157
C(104)	-0.0133	0.1353	-0.0983	0.9217
C(105)	0.0432	0.1142	0.3782	0.7053
C(106)	0.0324	0.1179	0.2752	0.7832
C(107)	0.2395	0.0760	3.1514	0.0017
C(108)	0.1770	0.0690	2.5634	0.0105
C(109)	0.1324	0.1324	0.9999	0.3176
C(110)	0.1697	0.0936	1.8130	0.0701
C(111)	0.0939	0.0844	1.1127	0.2661
C(112)	0.2229	0.1033	2.1579	0.0312
C(113)	0.2013	0.1206	1.6694	0.0953
C(114)	0.0487	0.1148	0.4241	0.6716
C(115)	0.1874	0.1038	1.8057	0.0712
C(116)	0.1469	0.0738	1.9892	0.0469
C(117)	0.6421	0.0952	6.7470	0.0000
C(118)	0.2184	0.1261	1.7326	0.0834
C(119)	0.3223	0.1225	2.6310	0.0086
C(120)	0.3034	0.1155	2.6255	0.0088
C(121)	0.1098	0.1491	0.7368	0.4614
C(174)	0.1709	0.1015	1.6827	0.0927

	Quintile 5			
Constant	0.9443	0.4796	1.9689	0.0492
Ag pc Y	1.0077	0.0859	11.7260	0.0000
NAg pc Y	0.9492	0.0523	18.1430	0.0000
Wgt*Ag pc Y	0.2163	0.1022	2.1155	0.0346
Wgt*NAg pc Y	0.0904	0.0605	1.4930	0.1357
Wgt	-0.9201	0.5822	-1.5803	0.1143
d60	-0.1056	0.0484	-2.1817	0.0293
d70	-0.0998	0.0384	-2.6024	0.0094
d80	-0.0576	0.0296	-1.9443	0.0521
C(126)	0.1219	0.0835	1.4602	0.1445
C(127)	0.6184	0.1096	5.6420	0.0000
C(128)	0.5338	0.1579	3.3809	0.0007
C(129)	0.2799	0.0735	3.8074	0.0001
C(130)	0.1995	0.0876	2.2773	0.0230
C(131)	0.3534	0.1115	3.1692	0.0016
C(132)	0.2995	0.1108	2.7032	0.0070
C(133)	0.3326	0.1323	2.5144	0.0121
C(134)	0.3653	0.1121	3.2582	0.0012
C(135)	0.3346	0.1164	2.8744	0.0041
C(136)	0.2757	0.0757	3.6429	0.0003
C(137)	0.0991	0.0681	1.4548	0.1460
C(138)	0.4700	0.1265	3.7142	0.0002
C(139)	0.1915	0.0932	2.0552	0.0401
C(140)	0.1648	0.0836	1.9706	0.0490
C(141)	0.3640	0.1032	3.5278	0.0004
C(142)	0.6101	0.1162	5.2502	0.0000

	Coefficient	Std. Error	t-Statistic	Prob.
C(143)	0.2677	0.1099	2.4372	0.0150
C(144)	0.1682	0.1028	1.6356	0.1022
C(145)	0.1351	0.0738	1.8312	0.0673
C(146)	0.4919	0.0917	5.3656	0.0000
C(147)	0.2816	0.1244	2.2633	0.0238
C(148)	0.1925	0.1079	1.7842	0.0747
C(149)	0.1067	0.1137	0.9378	0.3486
C(150)	0.4541	0.1476	3.0765	0.0021
C(175)	0.3218	0.0999	3.2209	0.0013

Determinant residual covar 0.0000

Equation: LRGDPQ1=C(1) + C(2)*WLAGPC + C(151)*WLNAGDPL +
C(152)*WGT2*WLAGPC + C(153)*WGT2*WLNAGDPL +
C(154)*WGT2 + C(7)*D60 + C(8)*D70 + C(9)*D80 +
C(10)*CDUM19 + C(11)*CDUM28 + C(12)*CDUM37 +
C(13)*CDUM38 + C(14)*CDUM39 + C(15)*CDUM42 +
C(16)*CDUM45 + C(17)*CDUM56 + C(18)*CDUM81 +
C(19)*CDUM86 + C(20)*CDUM90 + C(21)*CDUM92 +
C(22)*CDUM99 + C(23)*CDUM108 + C(24)*CDUM116 +
C(25)*CDUM122 + C(26)*CDUM127 + C(27)*CDUM140 +
C(28)*CDUM151 + C(29)*CDUM153 + C(30)*CDUM188 +
C(31)*CDUM193 + C(32)*CDUM194 + C(33)*CDUM196 +
C(34)*CDUM202 + C(171)*CDUM156

Observations: 181

R-squared	0.9371	Mean dependent var	6.3150
Adjusted R-sq	0.9224	S.D. dependent var	0.5204
S.E. of regre	0.1449	Sum squared resid	3.0674
Durbin-Watson	1.8838		

Equation: LRGDPQ2=C(35) + C(3)*WLAGPC + C(155)*WLNAGDPL +
C(156)*WGT2*WLAGPC + C(157)*WGT2*WLNAGDPL +
C(158)*WGT2 + C(36)*D60 + C(37)*D70 + C(38)*D80 +
C(39)*CDUM19 + C(40)*CDUM28 + C(41)*CDUM37 +
C(42)*CDUM38 + C(43)*CDUM39 + C(44)*CDUM42 +
C(45)*CDUM45 + C(46)*CDUM56 + C(47)*CDUM81 +
C(48)*CDUM86 + C(49)*CDUM90 + C(50)*CDUM92 +
C(51)*CDUM99 + C(52)*CDUM108 + C(53)*CDUM116 +
C(54)*CDUM122 + C(55)*CDUM127 + C(56)*CDUM140 +
C(57)*CDUM151 + C(58)*CDUM153 + C(59)*CDUM188 +
C(60)*CDUM193 + C(61)*CDUM194 + C(62)*CDUM196 +
C(63)*CDUM202 + C(172)*CDUM156

Observations: 181

R-squared	0.9723	Mean dependent var	6.8820
Adjusted R-sq	0.9659	S.D. dependent var	0.5495
S.E. of regre	0.1015	Sum squared resid	1.5040
Durbin-Watson	1.8395		

Equation: LRGDPQ3=C(64) + C(4)*WLAGPC + C(159)*WLNAGDPL +
C(160)*WGT2*WLAGPC + C(161)*WGT2*WLNAGDPL +
C(162)*WGT2 + C(65)*D60 + C(66)*D70 + C(67)*D80 +
C(68)*CDUM19 + C(69)*CDUM28 + C(70)*CDUM37 +
C(71)*CDUM38 + C(72)*CDUM39 + C(73)*CDUM42 +
C(74)*CDUM45 + C(75)*CDUM56 + C(76)*CDUM81 +
C(77)*CDUM86 + C(78)*CDUM90 + C(79)*CDUM92 +
C(80)*CDUM99 + C(81)*CDUM108 + C(82)*CDUM116 +
C(83)*CDUM122 + C(84)*CDUM127 + C(85)*CDUM140 +
C(86)*CDUM151 + C(87)*CDUM153 + C(88)*CDUM188 +

Coefficient Std. Error t-Statistic Prob.
 C(89)*CDUM193 + C(90)*CDUM194 + C(91)*CDUM196 +
 C(92)*CDUM202 + C(173)*CDUM156
 Observations: 181

R-squared	0.9825	Mean dependent var	7.2401
Adjusted R-sq	0.9784	S.D. dependent var	0.5851
S.E. of regre	0.0860	Sum squared resid	1.0795
Durbin-Watson	2.0217		

Equation: LRGDPQ4=C(93) + C(5)*WLAGPC + C(163)*WLNAGDPL +
 C(164)*WGT2*WLAGPC + C(165)*WGT2*WLNAGDPL +
 C(166)*WGT2 + C(94)*D60 + C(95)*D70 + C(96)*D80 +
 C(97)*CDUM19 + C(98)*CDUM28 + C(99)*CDUM37 +
 C(100)*CDUM38 + C(101)*CDUM39 + C(102)*CDUM42 +
 C(103)*CDUM45 + C(104)*CDUM56 + C(105)*CDUM81 +
 C(106)*CDUM86 + C(107)*CDUM90 + C(108)*CDUM92 +
 C(109)*CDUM99 + C(110)*CDUM108 + C(111)*CDUM116 +
 C(112)*CDUM122 + C(113)*CDUM127 + C(114)*CDUM140 +
 C(115)*CDUM151 + C(116)*CDUM153 + C(117)*CDUM188 +
 C(118)*CDUM193 + C(119)*CDUM194 + C(120)*CDUM196 +
 C(121)*CDUM202 +C(174)*CDUM156

Observations: 181

R-squared	0.9217	Mean dependent var	7.6183
Adjusted R-sq	0.9035	S.D. dependent var	0.6427
S.E. of regre	0.1997	Sum squared resid	5.8198
Durbin-Watson	1.9994		

Equation: LRGDPQ5=C(122, + C(6)*WLAGPC + C(167)*WLNAGDPL +
 C(168)*WGT2*WLAGPC + C(169)*WGT2*WLNAGDPL +
 C(170)*WGT2 + C(123)*D60 + C(124)*D70 + C(125)*D80 +
 C(126)*CDUM19 + C(127)*CDUM28 + C(128)*CDUM37 +
 C(129)*CDUM38 + C(130)*CDUM39 + C(131)*CDUM42 +
 C(132)*CDUM45 + C(133)*CDUM56 + C(134)*CDUM81 +
 C(135)*CDUM86 + C(136)*CDUM90 + C(137)*CDUM92 +
 C(138)*CDUM99 + C(139)*CDUM108 + C(140)*CDUM116 +
 C(141)*CDUM122 + C(142)*CDUM127 + C(143)*CDUM140 +
 C(144)*CDUM151 + C(145)*CDUM153 + C(146)*CDUM188 +
 C(147)*CDUM193 + C(148)*CDUM194 + C(149)*CDUM196 +
 C(150)*CDUM202 +C(175)*CDUM156

Observations: 181

R-squared	0.9909	Mean dependent var	8.4274
Adjusted R-sq	0.9888	S.D. dependent var	0.7391
S.E. of regre	0.0783	Sum squared resid	0.8958
Durbin-Watson	1.5816		

Equation: C(2)*0.08*0.598+C(3)*0.124*0.598+C(4)*0.164*0.598
 +C(5)*0.224*0.598+C(6)*0.408*0.598+C(151)*0.08*0.402
 +C(155)*0.124*0.402+C(159)*0.164*0.402+C(163)*0.224*0.402
 +C(167)*0.408*0.402=1

Observations: 181

S.E. of regre	0.0007	Sum squared resid	0.0001
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Equation: ((C(2)+C(152))*0.0416*.42+(C(3)+C(156))*0.0815*.42+(C(4)
 +C(160))*0.1259*.42+(C(5)+C(164))*0.1989*.42+(C(6)
 +C(168))*0.5522*.42+(C(151)+C(153))*0.0416*.58+(C(155)
 +C(157))*0.0815*.58+(C(159)+C(161))*0.1259*.58+(C(163)
 +C(165))*0.1989*.58+(C(167)+C(169))*0.5522*.58)=1

	Coefficient	Std. Error	t-Statistic	Prob.
Observations:	181			
S.E. of regre	0.0004	Sum squared resid		0.0000

Appendix E

Tests of the Differential Impact of Agricultural Productivity
on Growth in Per Capita Incomes by Quintile, and for Existence
of the "Kuznets Curve"

LS // Dependent Variable is ELASWT0

Date: 12-14-1997 / Time: 12:03

SMPL range: 1 - 10

Number of observations: 10

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	1.1220000	0.0475446	23.598881	0.0000
AGDUM	0.0558000	0.0194100	2.8748059	0.0282
QI	-0.0866072	0.0354693	-2.4417501	0.0504
QISQ	0.0108929	0.0057999	1.8781279	0.1094
R-squared	0.780866	Mean of dependent var	1.009900	
Adjusted R-squared	0.671299	S.D. of dependent var	0.053530	
S.E. of regression	0.030690	Sum of squared resid	0.005651	
Log likelihood	23.20295	F-statistic	7.126832	
Durbin-Watson stat	1.842790	Prob(F-statistic)	0.021035	

Residual Plot		obs	RESIDUAL	ACTUAL	FITTED
:	*	:	*	1	0.04391
:	*	:		2	-0.02016
:	*	:		3	-0.02201
:		:		4	0.00734
:	*	:		5	-0.00909
:	*	:		6	-0.02829
:	*	:		7	-0.00536
:	*	:	*	8	0.00479
:	*	:		9	0.04114
:	*	:		10	-0.01229

obs	AGDUM	ELASWT0	QI	QISQ
1	1.000000	1.146000	1.000000	1.000000
2	1.000000	1.028000	2.000000	4.000000
3	1.000000	0.994000	3.000000	9.000000
4	1.000000	1.013000	4.000000	16.000000
5	1.000000	1.008000	5.000000	25.000000
6	0.000000	1.018000	1.000000	1.000000
7	0.000000	0.987000	2.000000	4.000000
8	0.000000	0.965000	3.000000	9.000000
9	0.000000	0.991000	4.000000	16.000000
10	0.000000	0.949000	5.000000	25.000000

LS // Dependent Variable is ELASWT1

Date: 12-14-1997 / Time: 11:48

SMPL range: 1 - 10

Number of observations: 10

VARIABLE	COEFFICIENT	STD. ERROR	T-STAT.	2-TAIL SIG.
C	0.0081000	0.2124478	0.0381270	0.9708
AGDUM	-0.0112000	0.0867315	-0.1291343	0.9015
QI	0.4532928	0.1584906	2.8600615	0.0288
QISQ	-0.0481071	0.0259160	-1.8562731	0.1128
R-squared	0.843315	Mean of dependent var	0.833200	
Adjusted R-squared	0.764973	S.D. of dependent var	0.282871	
S.E. of regression	0.137134	Sum of squared resid	0.112835	
Log likelihood	8.232674	F-statistic	10.76448	
Durbin-Watson stat	2.344549	Prob(F-statistic)	0.007903	

Residual Plot		obs	RESIDUAL	ACTUAL	FITTED
*	:	1	-0.14509	0.25700	0.40209
:	*	2	0.09594	0.80700	0.71106
:	*	3	0.04819	0.97200	0.92381
*	:	4	-0.16236	0.87800	1.04036
:	*	5	0.16331	1.22400	1.06069
:	*	6	0.03571	0.44900	0.41329
:	*	7	0.10174	0.82400	0.72226
:	*	8	0.01499	0.95000	0.93501
:*	*	9	-0.11956	0.93200	1.05156
:	*	10	-0.03289	1.03900	1.07189

obs	AGDUM	ELASWT1	QI	QISQ
1	1.000000	0.257000	1.000000	1.000000
2	1.000000	0.807000	2.000000	4.000000
3	1.000000	0.972000	3.000000	9.000000
4	1.000000	0.878000	4.000000	16.000000
5	1.000000	1.224000	5.000000	25.000000
6	0.000000	0.449000	1.000000	1.000000
7	0.000000	0.824000	2.000000	4.000000
8	0.000000	0.950000	3.000000	9.000000
9	0.000000	0.932000	4.000000	16.000000
10	0.000000	1.039000	5.000000	25.000000